

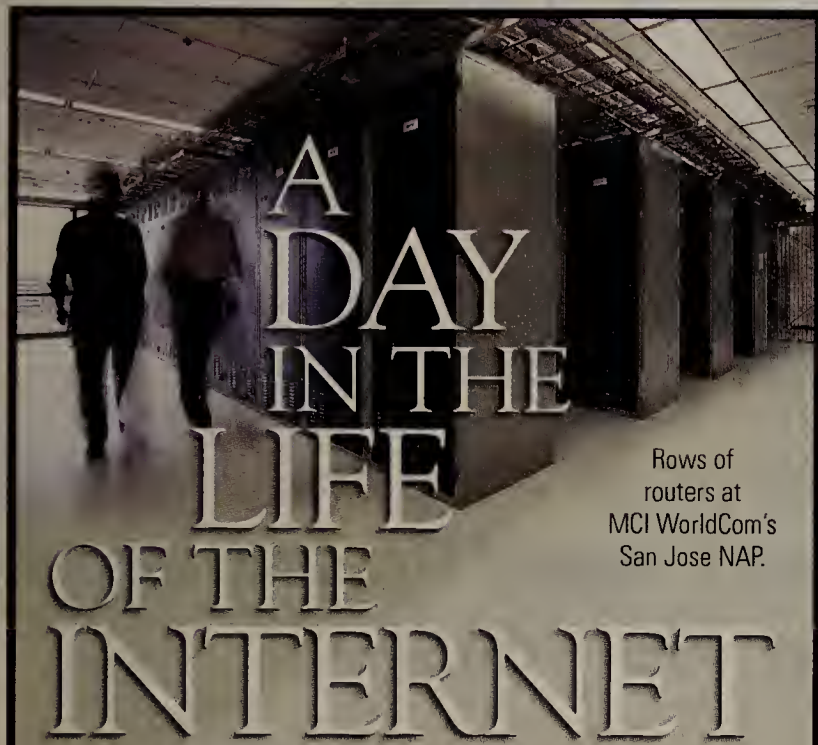
The newswweekly of enterprise network computing

# Network World



March 1, 1999 Volume 16, Number 9

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Rows of routers at MCI WorldCom's San Jose NAP.

**On Jan. 19, we stationed reporters at key Internet junctions around the globe to find out just what it takes to keep the 'Net humming.**

BY IDG NEWS SERVICE AND NETWORK WORLD STAFF

**It's**

nearly midnight and Internet traffic in Japan is spiking. Yashushi Sano, the man responsible for keeping Japan's part of the Internet backbone running, joins the online flurry of activity as he checks e-mail and chats with friends from his home in Yokohama.

At that same moment thousands of miles away, Franck Simon is monitoring midafternoon Internet activity from his office in Paris. Meanwhile, Mike Carroll settles in for the day at one of the busiest Internet exchanges in the world after battling rush hour traffic outside of Washington, D.C.

Welcome to the global Internet, where an unsung cadre of network managers keeps traffic on the order of multiple gigabits per second moving smoothly around the world.

See **Day in the life**, page 41

## Nortel gear to direct heavy Web traffic

BY ROBIN SCHREIER HOHMAN

**SANTA CLARA, CALIF.** — Two of the big four internetwork equipment makers already have some kind of load-balancing strategy. Nortel Networks will make it three when the firm announces plans to resell load balancers from IPivot under a relationship that could eventually

See **Nortel**, page 60

### More Online

- See how different load-balancing methods work.
- Take a look at load-balancing offerings from several vendors.

[www.nwfusion.com](http://www.nwfusion.com)

## Nortel crafts Catalyst killer

*Accelar upgrade guns for Cisco's biggest switch.*

BY JIM DUFFY

**SANTA CLARA, CALIF.** — Nortel Networks later this month is expected to unveil its next-generation routing switch, which sources say will give Cisco's backbone Catalyst 8540 a run for its money.

Nortel will roll out the Accelar 8000, a 10-slot switch that will support frame and ATM cell switching for LANs and WANs, sources say. The Accelar 8000 will also support Layer 2 and Layer 3 switching, and is designed for high-density 10/100M bit/sec and Gigabit Ethernet aggregation in the core of enterprise networks.

"We're starting to transition

our wiring closets to gigabit, and we really need something with higher density in the core," says Miguel Corteguera, assistant director for college network services at Miami-Dade Community College in Miami, who uses Nortel's current generation of Accelar switches. "We're also building an ATM WAN, but we plan to keep gigabit at the core of the LAN at each campus."

Currently, Nortel's top-of-the-line Layer 3 campus switch is the Accelar 1200, an eight-slot, 7G bit/sec frame-only switch. The Accelar 1200 supports up to 96 10/100M bit/sec Ethernet ports and 12

See **Accelar**, page 60

## DSL has a DLS (dirty little secret)

BY TIM GREENE

If you believe the vendor hype, you might think digital subscriber line (DSL) delivers guaranteed dedicated bandwidth. But it's not quite that simple.

DSL service that starts out at 1.5M bit/sec at your site isn't typically run at that bandwidth all the way through the DSL carrier's network. Rather, your line contends with other customers' DSL links for a shared pipe into the carrier network.

It is possible to buy a full bandwidth link all the way through the DSL carrier net, but be prepared to pay a premium and to negotiate service-level agreements (SLA) to ensure performance.

In the growing battle to sell inexpensive high-speed access pipes, DSL partisans claim their technology is better than cable modems because it offers dedicated bandwidth, while cable is


See **DSL**, page 59

### To-do list for DSL buyers


**When you buy digital subscriber line services:**

- Be aware of potential bottlenecks and ask for a service-level agreement.
- Understand exactly what portions of the network the SLA covers.
- Ping the network to get a sense of true throughput.





**“A broker in Cincinnati needs help with her PC; she  
headquarters in Louisville and says, ‘How soon can  
‘Right now, that’s me moving your mouse.’”**

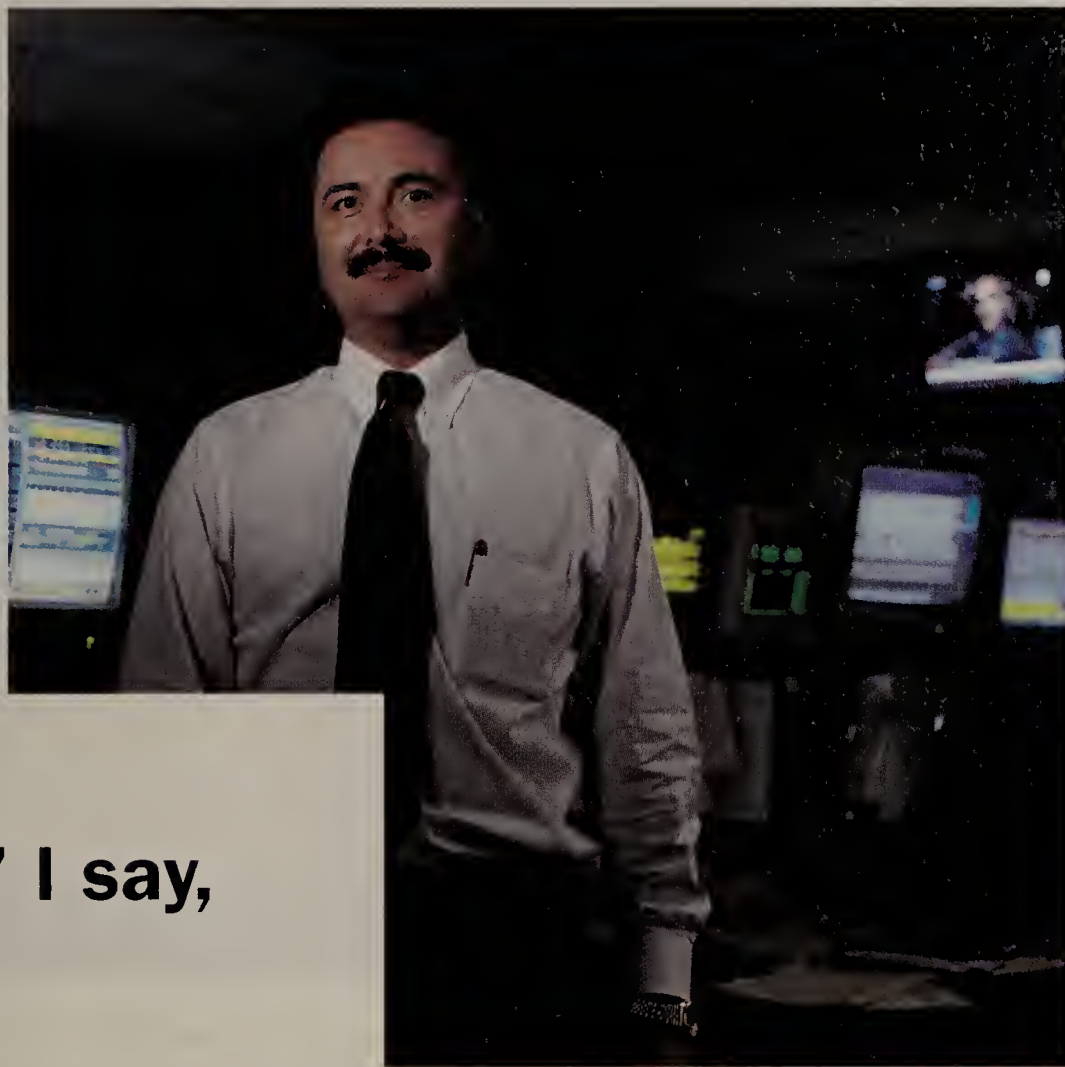


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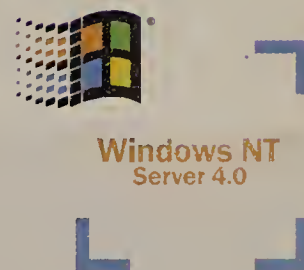
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**calls  
you be here?' I say,**



**"Moving cursors in faraway places is great, but there's more to the centralized management we get with Microsoft® Windows NT® on Dell® PowerEdge® servers. Like last night we were sitting right here, but we checked Y2K readiness on our desktops in Evansville. To get started, we did a remote inventory with Systems Management Server, and we used Dell OpenManage™ to dig a little deeper on the hardware side. It's surprisingly easy. Lately, the only reason for me to leave Louisville is vacation."**

**Jeff Polsgrove, CTO**  
Hilliard Lyons Investments



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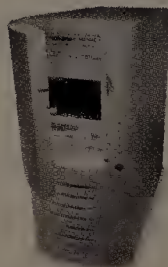
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## THIS WEEK ONLINE

**ISP surcharges?** What do you think of the FCC's ruling last week that calls to ISPs are interstate in nature? Will it change the Internet? We've set up a forum to discuss it. You can also get background information on the case.

**DocFinder: 1752**



**A day in the life of the Internet.** Read our front-page story on the topic, then come online to discuss how the Internet really

works with Dan Lasater, MCI WorldCom's director of broadband applications and architect of the company's metropolitan-area exchanges. We've set up a special forum this week where you can pose your questions to him and read his comments.

**DocFinder: 1743**

**Print this.** Want to print out a copy of a Fusion article? This week, we start adding a cgi-bin script to our stories and documents that will produce printer-friendly versions. Look for the printer icon at the top of articles.

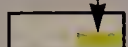
**New resources.** We've added a number of ATM papers to our Net Resources area and an entire page of FDDI links. **DocFinder: 1750**

**New file uploads.** Every week, we get several new demonstration and evaluation applications added to our Download area. This week, we've added several Web servers. Check out the What's New page to see any you might have missed. **DocFinder: 1751**

**What's on your bookshelf?** Several readers responded to last week's request for help on coming up to speed on network technologies. Come online to see what they recommended, and add your own ideas. **DocFinder: 1642**

### How to get onto Network World Fusion

Click on Register on the home page and follow the instructions. Subscribers, keep your NWF number — highlighted on the front cover's mailing label — handy during registration. Nonsubscribers must fill out an online registration form.



# NetworkWorld

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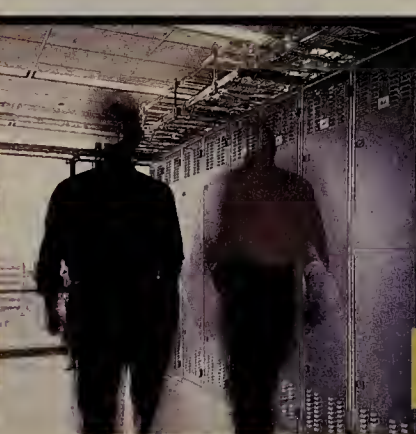
### Special

## Focus

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Standards body work is key to IP application rollouts. Page 20.

### FEATURES



## A day in the life of the Internet

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**REVIEW:** Vasco's VACMan/Server 3.0 proves its mettle in our look at four security server/hardware token combos. Page 47.



NEWS BRIEFS, MARCH 1, 1999

**FCC opens door a crack for Internet usage fees**

For the first time, the Federal Communications Commission has moved away — ever so slightly — from its long-standing policy that telephone companies cannot charge ISPs telephony-style per-minute access fees. Users have feared those kinds of fees would force ISPs to at least partly charge by usage for dial-up connections, just as long-distance phone calls ring up per-minute bills.

The FCC last week ruled that ISP dial-up connections are not really local calls but basically the same as long-distance connections because the user's goal is to reach a distant Web site. Yet at the same time, the FCC said that existing agreements among regional Bell operating companies, competitive local exchange carriers and ISPs that treat Internet access traffic as local calls must remain in place.

The FCC insisted that this means Internet access will remain free of per-minute charges for now. But a dissenter — Republican Commissioner Harold Furchtgott Roth — warned that RBOCs may eventually use the decision to level access fees on ISPs. BellSouth, for one, released a statement saying it will decide what to do after examining the full ruling.

**Virginia to spammers: Go ahead, make my day**

If you spam in Virginia, be prepared to pay a price. Virginia Gov. James Gilmore last week said he will sign legislation that lets prosecutors pursue junk e-mailers and gives Virginia e-mail providers the right to collect damages from spammers.

The law would make serious spamming incidents a felony punishable by fines or jail, and would give service providers or individual e-mail users the chance to seek civil penalties.

Under the statute, e-mail companies could seek civil penalties of \$10 per message or \$25,000 per day.

The antispam legislation also targets the anonymity and fake identities to hide the source of bulk e-mail. Under the law, it would be illegal to own software that helps people hide their online identities.

Industry experts say the Virginia law could have a big impact because so many Internet companies are based there: America Online, CompuServe, PSINet and MCI Worldcom's Internet group, to name a few.

California is the only other state that has criminalized spam activities.



**Big Blue not afraid of Y2K winter**

The Year 2000 computer problem isn't likely to cause a "digital winter" that will



**IBM's Gerstner: Some Y2K disruptions are likely, but nothing dire.**

disrupt the entire world, IBM CEO Louis Gerstner said last week at the company's Business Partner Executive Conference. But Gerstner hedged his bet a bit by saying, "Nobody knows exactly what will happen 311 days from now —

it's likely we will see some disruptions but nothing on the order of the dire forecasts that some have predicted." Gerstner made it clear that he is concerned about small businesses, which seem less prepared for the rollover to the year 2000 than large companies. "What we can't do is sit back on our heels and see which way the ball bounces," he said.

**Alive and kicking**

While it just missed Wall Street expectations, Novell last week reported its sixth consecutive profitable quarter.

For the first fiscal quarter ended Jan. 31, profits more than doubled to \$29 million from \$14 million in the first quarter last year. Revenue rose 13% to \$286 million from \$252 million in the first quarter last year. CEO Eric Schmidt says sales of directory-enabled products accounted for 88% of total revenue in the quarter. Revenue from NetWare 4.X and 5.0 servers totaled \$146 million, up 16% from the first quarter of 1998. Revenue from network applications, such as GroupWise collaboration software, ManageWise and ZENworks management software, increased 50% compared to the first quarter of last year to \$53 million. Infrastructure products, such as BorderManager and NDS for NT, contributed \$15 million in first-quarter revenue, up 68% from the year-earlier period.

**Losing my assistants**

AT&T Chairman C. Michael Armstrong last week lost a key deputy as Robert Annunziata, president of the carrier's business-services group, quit to join a new international carrier as CEO. Before AT&T, Annunziata was CEO of Teleport Communications Group, a competitive local exchange carrier that AT&T bought last year. Armstrong installed Annunziata ahead of AT&T lifers to kick the carrier's fast-packet, IP and voice offerings into high gear. Annunziata is joining Global Crossing, Ltd., a high-speed transport provider mostly serving other carriers.

# Microsoft maps out e-comm strategy

BY CHRISTINE BURNS AND ELLEN MESSMER

**SAN FRANCISCO** — Microsoft has lined up its big guns to tout the company's electronic commerce strategy this week.

Reminiscent of the high-profile media-circus event of 1995, when the company officially embraced the Internet, Microsoft CEO Bill Gates and President Steve Ballmer will appear on the same San Francisco stage Thursday to outline a cohesive e-commerce strategy.

Gates and Ballmer are expected to sketch out how a future version of Microsoft's Site Server 3.0 Commerce Edition will run on top of Windows 2000 and tap into Windows' new Active Directory, as well as public-key infrastructure and high-availability features. The event will also showcase a number of customers who have anchored their e-commerce deployments with Microsoft's Windows NT-based Site Server 3.0 Commerce Edition platform, Internet Information Server 4.0 Web server and SQL Server 7.0 database.

While Microsoft refused to disclose any further details, users were quick to point out several areas where the company's approach to e-commerce needs work. They say Microsoft's existing storefront software is unattractive and difficult to customize. Some users also feel Microsoft's e-commerce back-end needs to be more scalable, offer better support for data warehousing and provide better ties to Microsoft Transaction Server.

When Site Server 3.0 Commerce Edition shipped last summer, Microsoft positioned it as an out-of-the-box storefront for corporations and a platform upon which vendors could build their own electronic procurement wares. Users say Microsoft may have tried to do too much by offering the same product to both

audiences.

Microsoft's automated tool — referred to as a wizard — is universally derided for creating an instant storefront.

"It's ugly, and you'd be nuts to use it," says Andrew Brust, a New York software developer and president of Progressive Systems Consulting.

"There are a bunch of holes in the wizard; for example, it can't do e-mail confirmation," claims Joe Kuzma, a Washington, D.C. Web designer. "The main problem is you have to rewrite a lot of the code in the wizard."

The wizard is there to "help people get started," says David Roth, president of Stratis Group, a Murray Hill, N.J., integrator specializing in e-commerce. "But people are finding the wizard isn't the answer and that changing the code behind it is a problem. So the wizard is a throwaway."

On the back end, though, Roth says Site Server 3.0 Commerce Edition does have some very useful features, such as the application-to-application data interchange pipelines that handle things such as order handling and tax calculation.

Microsoft could improve upon these interchange pipelines by adding hooks to its Microsoft Transaction Server, users say. This would ensure the integrity of transactions, such as the processing of customer orders on the back-end. ■



Be a **Net Know-It-All**

For the answer to this week's question and more net trivia, visit Network World Fusion and enter 2349 in the DocFinder box.

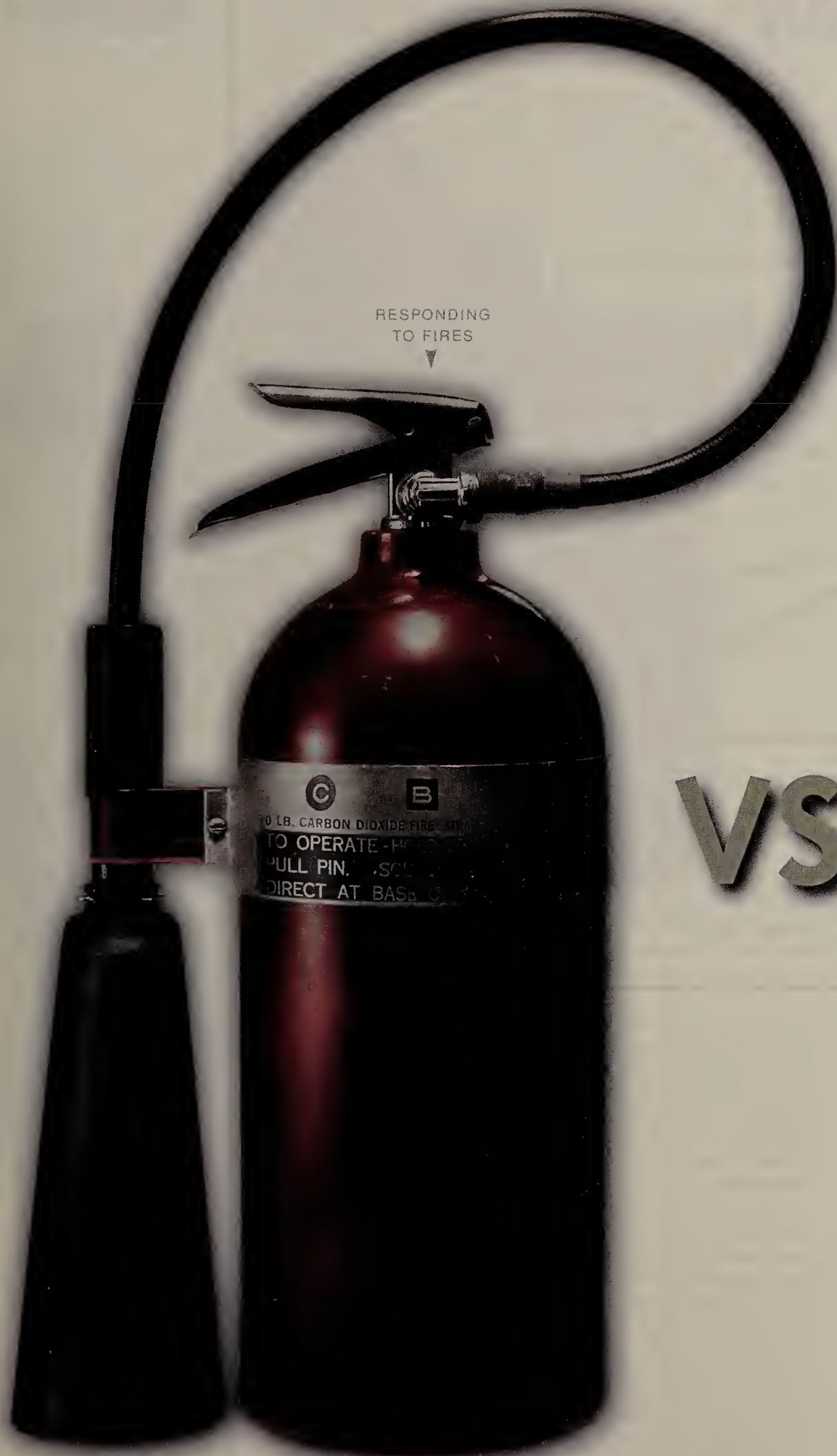
**This week's question:**

What is the Abilene Project?

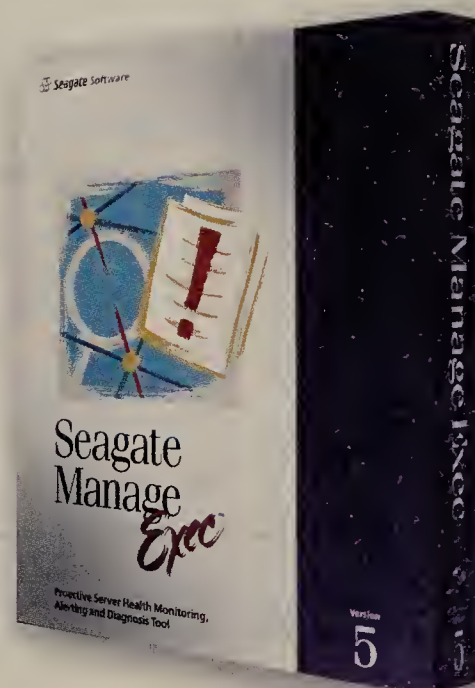
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# Dell pounds out a SAN

BY DENI CONNOR

Earlier this year Dell dipped its toes into the storage-area network (SAN) waters by agreeing to OEM host bus adapters from QLogic.

Last week the company dove all the way in with a low-cost SAN plan for Windows NT networks, and some analysts are claiming that Dell's strategy is one of the most complete of any server vendor to date.

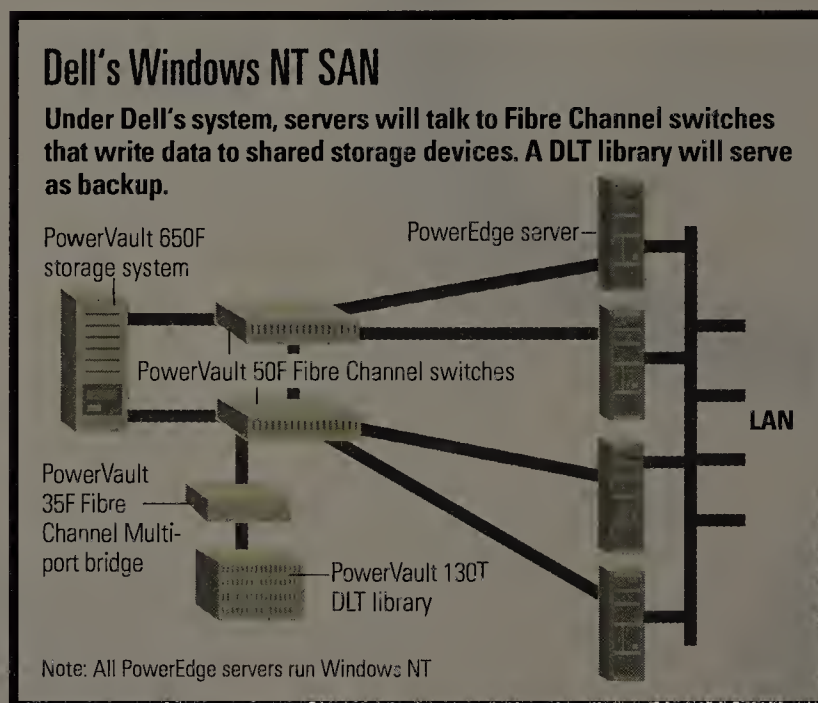
Dell's PowerVault is a line of home-grown and OEMed SAN gear that includes Fibre Channel, backup, and security and authentication products, all for Windows NT.

The Dell eight-port Fibre Channel switch, the PowerVault 50F, will cost about \$1,350 per port. Pricing for the Fibre Channel Multiport bridge starts at \$5,000. The fiber-optic host bus adapter's price starts at \$1,479.

Dell also announced a set of service and integration programs to supplement its SAN package. According to analysts, integration and interoperability have been two of the sticking points for wide-scale SAN adoption.

In its target market, NT, "Dell's SAN is a credible threat to other vendors' SAN implementations. By introducing a low-cost SAN, they've presented a real value, which, unlike

company has great technical support, and with their trained storage specialists, can deliver integration services that are critical to customers," McArthur says.



other vendors' products, is available now," says John McArthur, program director of Storage Systems Research at International Data Corp. in Framingham, Mass.

McArthur is also impressed with the service plan. "The

The Dell SAN lets up to four Dell PowerEdge servers share a single PowerVault 650F storage subsystem and a PowerVault 130T digital linear tape library, allowing high-speed storage and backup. Dell will work with Computer Asso-

ciates, Legato, Tivoli/ADSM and Seagate on network backups.

By working with Microsoft, Dell has eliminated a nettlesome NT feature. Windows NT servers by nature think they own access to any device they can see. In the case of SANs, in which multiple servers may share a common drive, this presents a conflict.

To solve it, Dell and Microsoft built Dell Open-Manage Storage Consolidation software, which lets individual NT servers own certain portions of a disk subsystem. Microsoft will build this technology into Windows 2000.

Dell will OEM various components of the SAN. The company chose Crossroads Systems' Fibre Channel-to-dual-SCSI bridge and Brocade's Silkworm switch as the links between the network and the storage device. The company also announced an OEM agreement with Network Appliance, which will release network-attached storage data servers later this year.

Also as part of its SAN announcement, Dell says it is expanding its technical consulting services to offer storage planning and storage consolidation and performance, as well as backup and recovery. These services will be available in May. ■

## Oracle joins the directory race

*Offers service for corporate users, carriers, ISPs.*

BY CHRISTINE BURNS

**REDWOOD SHORES, CALIF** — In an effort to give customers a single place to store user information for all commercial and custom-built Oracle8i database applications, Oracle last week announced its own standards-based centralized directory service.

The Oracle Internet Directory is a Lightweight Directory Access Protocol (LDAP) Version 3-compliant directory designed to hold user names, passwords and access rights. Currently, each Oracle8i application requires its own directory.

The new directory is a back-end service that uses an

Oracle8i database as its data store. It can run on any server operating system that supports Oracle8i databases, including Windows NT and most flavors of Unix. Any application written to the LDAP API or any LDAP Version 3 client can access information stored in the directory.

The directory gives administrators a single place for controlling end-user access to any Oracle-based applications. With the software, users have to log on just once for all Oracle8i applications.

Houston Community College in Texas beta-tested the directory as the central user information store for its Oracle8i-based internal e-mail system and its Internet mail

service. "It's important for the 5,000 students and instructors to have access to both of those network services, but managing user rights separately was a real hassle," says Annette Hearn, senior systems administrator.

Managing user access via the directory has worked so well that Hearn is planning to make it the central directory for the college's human resource, student tracking and financial applications, as well.

Oracle officials claim the company's new directory software can hold up to 500 million objects and support tens of thousands of simultaneous users. Industry analysts say the product is as scalable as any other directory on the market.

Oracle's directory is available now in two versions — one targeting the enterprise market and one better suited for ISPs and telcos that want to host directory-enabled Internet applications. Oracle will

charge for end users inside the firewall on a per-seat basis. The Internet version will be priced based on the number of entries in the directory. Exact pricing was not available at press time.

Oracle also announced an agreement with Novell in which the two will integrate Oracle's directory with Novell Directory Services (NDS). The companies will first offer single sign-on capabilities between the two services and will offer a single administration model at a later date. The companies say they will also make NDS run natively on Oracle8i.

Oracle and Novell will compete, however, for the large-scale ISP and telco directory contracts. Novell's next version of NDS — dubbed scalable NDS (SCADS) — is supposed to be better suited for these demanding environments than previous renditions of the directory.

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## THE MICROSOFT DIARIES

THE MICROSOFT-DOJ TRIAL: WEEK SEVENTEEN

MONDAY, FEB. 22

Dan Rosen, Microsoft's general manager of new technology, today said that in 1995 he had a better perspective on how big a threat Netscape was than Bill Gates did. "Bill was probably wrong" at that time, Rosen said in response to Department of Justice lawyer David Boies' question about a Gates memo. The memo called Netscape "a new competitor born on the Internet."

Rosen said he spent more time talking to Netscape, and he was the ranking official at a meeting in which Microsoft allegedly schemed to split the browser market with Netscape. Rosen testified — contrary to sworn statements by several Netscape executives — that no illegal proposal was ever made.

But Rosen's credibility suffered a blow when Boies caught him misstating whether or not he had circulated e-mail about how Microsoft could wrest control of the browser market from Netscape. Rosen, obviously embarrassed, had to correct his own sworn testimony.

TUESDAY, FEB. 23

Boies today continued to poke holes in Rosen's credibility. Boies asked Rosen when he first received a copy of Netscape's browser. Rosen said it was July 1995. Boies produced two e-mails that proved Rosen had the software in April 1995. "I stand corrected," Rosen blurted.



Kempin questioned on Microsoft-PC maker deals.

WEDNESDAY, FEB. 24

The man who negotiates Windows deals with PC makers, Joachim Kempin, took the stand today.

Boies pounced, pushing the point that Compaq got preferential treatment from Microsoft because the PC giant favored Internet Explorer over Navigator. No, no, Kempin said. Compaq competitors who haven't pledged their loyalty to Internet Explorer, like Gateway 2000, get the same treatment, Kempin said. They can all add Navigator registration

screens before the Windows welcome screen appears. However, nobody can alter the Windows boot up sequence itself.

THURSDAY, FEB. 25

Boies and Kempin went in circles today about whether or not customers are hurt by the licensing deals Microsoft strikes up with PC makers. Boies argued that Microsoft's intent is to limit end users' choice of browsers. Kempin said Microsoft is merely trying to protect its intellectual property in Windows.

FRIDAY, FEB. 26

Robert Muglia, a Microsoft senior vice president, was the last witness to face cross-examination before the trial recessed for six weeks. Muglia said that Microsoft has enhanced Java to help consumers, an effort the company had to make because Java failed to deliver cross-platform performance.

But the prosecution once again pulled out internal Microsoft documents, such as the one in which Muglia said Microsoft should "kill Java by growing a polluted Java market."

— Christine Burns

## Windows terminals target multimedia

BY JOHN COX

Hewlett-Packard and Wyse Technology this week will separately unveil high-end Windows-based terminals that can access video- and audio-heavy applications.

However, the products may prove to be a little before their time. While today more companies are using video applications for corporate training, most companies still aren't making extensive use of multimedia programs.

In addition, buyers of the new devices will not be able to exploit full-motion video until later this year. That's when Microsoft and its partner, Citrix Systems, are expected to add support for full-motion video to their server-based software products.

Both HP's and Wyse's new terminals use the 200-MHz Cyrix MediaGX processor and include 2M bytes of video RAM, double the amount contained in earlier products.

The key feature of the Cyrix processor is a companion chip that shoulders the burden of decompressing the video datastream being sent to the terminal.

The companion chip also

keeps the audio and video data synchronized, as if you were watching a videotape.

As a result, the MediaGX chip stays free to run several application sessions at once at full power.

HP's new NetVectra 310



Hewlett-Packard's NetVectra is prepared for tomorrow's video chores.

has a 10/100Base-T network adapter and two Universal Serial Bus (USB) ports. HP has also added a package of 15 terminal emulators, covering a wide range of minicomputers and mainframes.

NetVectra 310 has 16M bytes of dynamic RAM (DRAM) and 8M bytes of flash memory, the

same as in HP's previous model.

Companies will be able to manage NetVectra from remote servers using HP's TopTools, which is a Web-based tool set. HP also has added an SNMP agent that will let NetVectra be seen and controlled by network management systems such as HP's OpenView and Computer Associates' Unicenter.

HP estimates the street price for the NetVectra will be around \$700.

The new Wyse terminal, dubbed the Winterm 3350SE, resembles HP's offering. It, too, has two USB ports and features 15 terminal emulators.

The new Winterm supports a resolution of 1280 by 1024 pixels, a 10/100Base-T interface and a PC Card bus. Like the HP terminal, the Winterm has 16M bytes of DRAM and 8M bytes of flash RAM.

The terminal is available now. Wyse estimates the product will cost around \$750.

HP: (800) 752-0900; Wyse: (800) 438-9973

## 3Com, IBM debut palmtops for corporate users

BY JOHN COX

3Com and IBM last week introduced palm-size computers aimed squarely at corporate computer users.

The vendors have enhanced their handheld organizers by adding memory, expansion slots for peripherals such as pagers, an optional 33.6K bit/sec modem and connectivity software.

3Com unveiled the Palm IIIx and V, both sporting a new microprocessor, the latest version of the Palm operating system, and a clearer monochrome screen. IBM sells the devices under its own label, called WorkPad 30x and c3, respectively.

IBM's WorkPads feature additional software. This includes EasySync for Lotus Notes,

which connects the device to Notes servers, and WorkPad Infrared Synchronization, which lets WorkPad users exchange data with one another.

The Palm IIIx doubles the memory of the Palm III organizer to 4M bytes, allowing users to work on bigger applications and store more data. The IIIx also has an improved LCD screen that creates a clearer monochrome display than the Palm III's backlit screen.

The Palm V represents a greater break with the earlier models. It weighs just four ounces instead of about six, and is less than 1/2 inch thick, compared with about one inch for the Palm III models. Instead of using two AAA batteries, the Palm V uses a lithium ion battery that recharges when the

device is put into its accompanying cradle. 3Com says the charged battery runs for about two weeks.

"The new Palm V case fits a lot nicer in my palm. The design is very thin and attractive," says Steven Lui, vice president of investment and systems at Insurance Corp. of Hannover in Los Angeles. "The Palm operating system is extremely efficient; unlike the bloated Windows CE systems with their higher-resolution screens, the Palm can perform any of the prescribed tasks much quicker."

Suggested retail prices are \$369 for the Palm IIIx and \$449 for the Palm V. The corresponding IBM products are priced similarly.

IBM: (800) 426-7255; 3Com: (408) 326-5000





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# Intel gives hope for distributed policy management

BY SANDRA  
GITTLEN

HILLSBORO, ORE. — Joshua Norrid has held off rolling out policy-based network management because he says the technology is lacking. But a policy management project underway at Intel has him reconsidering.

Norrid, who is director of application development at Bristol Hotels & Resorts in Dallas, says policy-based network management could be a powerful tool for his company's chain of 120 hotels, but it lacks useful tie-ins to remote locations and directory services. Researchers at Intel Architecture Labs are working to solve Norrid's dilemma by developing distributed policy-based network management technology.

Policy management involves network managers defining rules, or sets of if-then statements, that describe traffic priority and user access rights. In a distributed system, a central policy server would send rules across the net to departmental or remote policy servers, says John Richardson, director of Internet Security and Services at Intel Architecture Labs.

The network administrator configuring the central policy server would retain control

over general policies, but lower-level policy decisions could be made by department heads or even end users.

Currently, policy management schemes from the likes of 3Com, Cisco and Nortel Networks rely on a central policy management server that sends instructions to various network servers that simply carry out the central server's orders.

Intel's distributed policy project is still at a very early stage, and few details are available. The company declined to say when distributed policy technology will show up in commercial products. However, Intel says the technology will build on proposals for policy management before the Internet Engineering Task Force (IETF) and the Desktop Management Task Force. Intel has been working on policy management technology for about two years, and is teaming with Hewlett-Packard on policy technology for HP's OpenView net management platform.

## Distributed system needed

Bristol Hotels & Resorts is deploying a frame relay network to link its hotels. "Each one of those hotels has its own file server and network," Norrid says. "However, they are

still a logical extension to the home office."

If he were to roll out policy management now, Norrid would still be responsible for every personnel update the hotels made, as well as the employees' access to LAN and WAN resources. With distributed policies, he could set general policies to dictate access by job title and then distribute these policies to the hotels. Managers could use the information to give new employees appropriate access rights.

Norrid says tying in directory services would be key because he could give users a single password to access all applications.

"The time and cost savings could be enormous," Norrid says. "Right now, every application I roll out, I have to tie into an existing security model or create a new one. A user might have six passwords."

In fact, Intel's distributed policy research involves the use of the Lightweight Directory Ac-

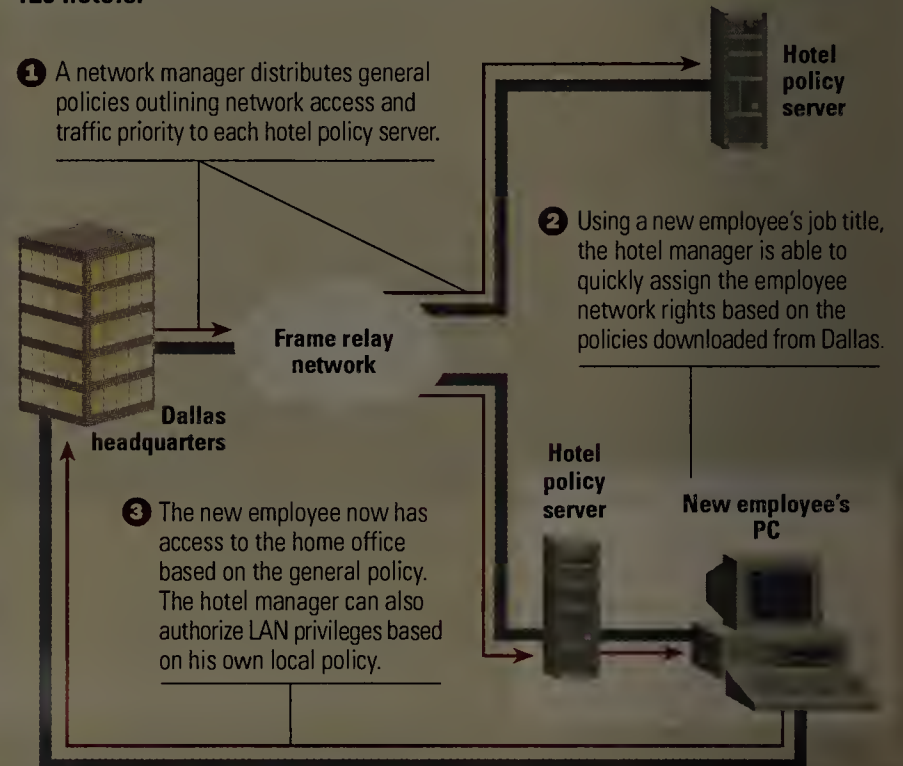
cess Protocol to tie users' profiles to their net access rights.

The IETF is set to meet later this month on the proposals for centralized policy-based net-

work management. Intel, which co-authored some of the proposals, has no time frame for pitching its distributed policy approach. ■

## Distributed policy plans

**Bristol Hotels & Resorts says it could use distributed policies to ease its network administration burden between the home office and the company's 120 hotels.**



## Pricey Java tools guide shoppers

BY ELLEN MESSMER

SAN JOSE — Selectica has just shipped the ACE 3.0 Product Suite, a set of Java-based software modules that helps online shoppers find merchandise according to specific qualities, such as price or color.

Acting like a virtual sales assistant, the ACE Advisor software module takes the buyer's wish list, which can be composed within any Web browser, and checks back-end databases to find products meeting the customer's interests. Once ACE has found the right stuff, it sends product information and images to the Web storefront.

The ACE suite contains another new module, ACE Pricer, which keeps a running tally of product costs.

ACE 3.0 has been getting a test drive on the BMW AG Web site, where people can check out the latest features and

prices of automobiles. Ralf Maltzen, BMW's marketing manager for Internet applications, says ACE 3.0 helps provide a "highly personalized consumer experience."

Like BMWs, ACE 3.0 isn't cheap. The ACE Enterprise server, which comes bundled with the ACE Configuration Engine, ACE Pricer and ACE Advisor modules, costs \$150,000.

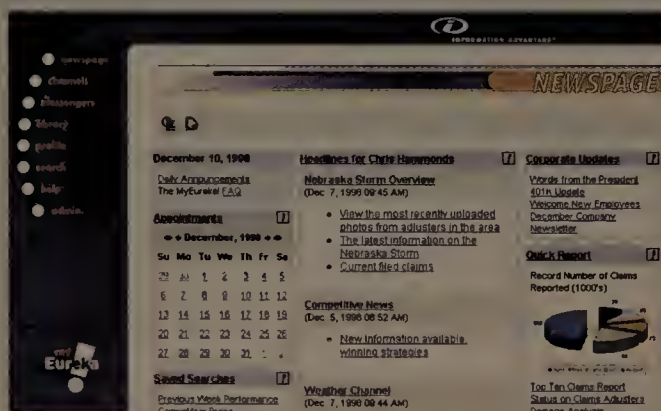
ACE Quoter, a new module for storing the customer's product selections and pricing in a central database with links to electronic commerce components, costs \$150,000 per module.

The ACE Connector for Oracle, a direct link from ACE into Oracle databases and applications, costs \$150,000 per deployment. The set of modeling tools for the ACE line, called ACE Studio, costs \$25,000 per seat.

Selectica: (408) 570-9703

## QUICKTAKE

### MyEureka!: A portal in every port



By now everyone in this business has heard of portals: Yahoo!, Netcenter, the list goes on, and on, and on.

Information Advantage believes there are not enough portals. In fact, the company thinks every company (and even every employee) should have its very own portal.

That's where MyEureka!, a so-called business intelligence portal for the enterprise, enters the equation. The MyEureka! system can cull information from a variety of data sources, including databases and enterprise resource planning (ERP) and reporting systems, and then present links and summaries of

the data on a personalized Web page. Users can subscribe to specific reports and set up agents that alert them if certain reports or charts have been recently updated. This way, only items of importance appear on the portal page.

At the system's core is the MyEureka! Content Server, a repository for all the company's business intelligence information. The Content Server can link to many of the leading business intelligence tools and ERP systems, as well as other third-party data systems.

Written in Java, MyEureka! can be deployed on any server with a Java Virtual Machine. Prices range from \$100 to \$1,000 per user and are based on the combination of portal and business intelligence components being deployed.

Information Advantage: (612) 833-3700





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## Briefs

Start-up **Clarinet Systems, Inc.** this month will unveil an infrared wireless LAN that provides 4M bit/sec to the desktop. Portable PCs can use their infrared ports to communicate with the EthIR LAN access-point box. No network card is necessary. An eight-port system costs \$1,700, and a 16-port system costs \$3,200.

Clarinet: (408) 501-0250

**Madge Networks** has begun shipping a switch designed to bring ISDN videoconferencing capabilities to small and branch offices. The Madge Intelligent Switch can tie desktop videoconferencing gear into a WAN for site-to-site videoconferencing. It can also switch video traffic locally. The box has eight Basic Rate Interface ISDN ports and three T-1 ports. It costs \$8,000.

Madge: (408) 955-0700

**Citrix Systems** has released the latest version of its MetaFrame software for multiuser NT servers. Among the new features in MetaFrame 1.8 are the administration of groups of servers across subnet boundaries; the automatic connection of users to a backup server group if the primary group fails; and support for client computers running Linux and Santa Cruz Operation Unix operating systems.

MetaFrame 1.8 costs \$5,995 and includes a license for 15 concurrent users and a one-year subscription for all MetaFrame enhancements, updates and maintenance releases.

Citrix: (954) 267-3000



**MetaFrame 1.8 can connect users to a backup server group.**

IN-SITE: *Lessons from Leading Users*

## Massachusetts college takes a class in VPNs

BY TIM GREENE

**F**itchburg State College is betting that its new virtual private network (VPN) will be able to handle an expected flood of remote users as the school opens its network resources to satellite campuses, telecommuters and local public schools.

Potentially, thousands of remote users will have to be authenticated and granted restricted rights to the campus network, says Joe Turner, associate director of MIS. And the Massachusetts college really isn't sure what network resources will be most in demand, he says.

"Do we have a driving application right now? No. How will we actually use the VPN? I don't know," says Turner, who designed the VPN with extreme flexibility in mind.

The VPN has been set up because:

- The college is negotiating with the City of Fitchburg to set up homework-zone.com, a place where middle school kids can post academic questions to professors.

- The faculty is clamoring to work more at home. "They say, 'We need to

do more than just pick up our e-mail,'" Turner says.

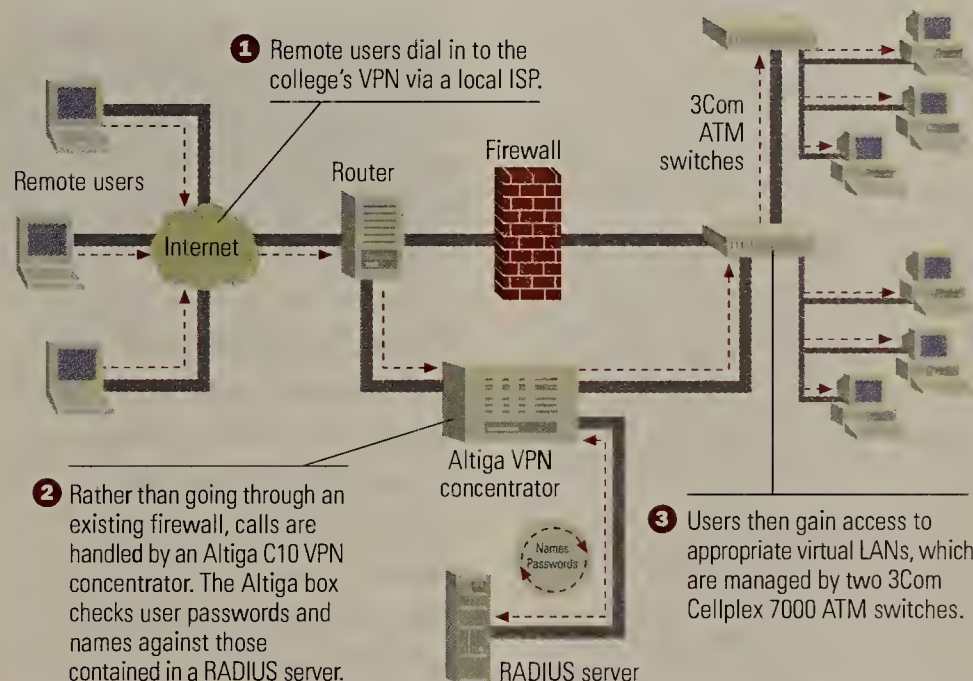
- Fitchburg State is offering courses

and degrees to students in Bermuda, which has no four-year college.

See **IN-SITE**, page 18

### Fitchburg State's VPN course

This Massachusetts state college has set up a VPN to accommodate an anticipated increase in remote access users.



## Procom gives users more network storage space

*NetForce high-end data servers designed for data warehouse applications.*

BY DENI CONNOR

**P**rocom Technology last week introduced a pair of aggressively priced servers aimed at data warehouse environments requiring lots of storage capacity and high availability.

The NetForce 2000 and 2200 network-attached storage systems, which Procom previewed at the FOSE '99 government IT show in Washington, D.C., are Procom's first high-end data servers.

The new products put Procom into competition with the likes of Network Appliance and Auspex in this segment of the storage market, according to Farid Neema, president of Peripheral Concepts, a market research and consulting firm in Santa Barbara, Calif.

The 10-bay NetForce 2000 stores up to 180G bytes of data; the 2200 has a larger disk and supports up to 900G bytes. Both models can be attached to Windows NT or Unix networks and allow users to share data across both network types. The devices attach to networks via 10/100Base-T or Fibre Channel interfaces.

The servers support RAID levels 0, 1, 3, 5 and 10. The 2200 is available in an active-active RAID architecture, in which RAID controllers back each other up in the event of a failure. Pricing for the new NetForce systems starts at \$35,000.

Neema says the new NetForce models are attractively priced given their availability features. He points to the servers' online expansion capabilities, which enable users to add drive capacity without taking the systems offline.

In April, Procom will unveil the 2500 and 2600 data servers, which will provide even more capacity. They will handle from 900G bytes to 1.8 terabytes of data. Pricing for these models will start at \$100,000.

Procom has also upgraded its product line by introducing a rack-mountable version of its entry-level NetForce 100R data server for NT networks. The server boasts 24G to 80G bytes of net disk capacity. The 100R features a 10/100Base-T interface, and pricing starts at \$5,700.

Procom also announced the DataForce 250 and 275, the latest versions of its CD-ROM workgroup servers. The servers, which attach to networks via 10/100Base-T, hold 250 and 275 CDs, respectively. Pricing starts at \$8,592.

Procom: (949) 852-1000



# 3Com bolsters VPN, telephony support

BY JIM DUFFY

SANTA CLARA, CALIF. — 3Com is bulking up its virtual private network (VPN) and telephony capabilities via separate product development and acquisition initiatives.

3Com this week is expected to announce a partnership with Advanced RISC Machines (ARM) to add more processing punch to 3Com network interface cards (NIC).

Specifically, ARM's 32-bit Reduced Instruction Set Computing technology will enable 3Com NICs to segment TCP packets so it's easier to add tunneling, encryption and other security features to the data for transport over a VPN.

For LAN telephony, 3Com last week announced a definitive agreement to acquire NBX, an Andover, Mass., developer of telephony systems that integrate voice and data over small business LANs and WANs. The transaction is worth about \$90 million.

Under the ARM arrangement, 3Com will develop NICs that will be able to offload TCP processing from host computers. The ARM chip on the NICs will segment the packets, while another on-board chip from VLSI Technology will add IP Security encryption to the packets.

The ARM and VLSI chips will allow host computers to dedicate more CPU power to application processing.

ARM has a similar arrangement with 3Com rival Intel. One reason 3Com partnered with ARM was to add intelligence to 3Com NICs in order to make them more attractive than Intel NIC technology embedded into PC motherboards, says Esmeralda Silva, LAN analyst at International Data Corp. in Framingham, Mass.

## NBX buyout

The NBX acquisition is a way for 3Com to respond to Cisco, which acquired LAN PBX vendor Selsius Systems last year.

According to 3Com's estimates, the worldwide market for LAN telephony will be approximately \$5 billion by 2003, with more than two-thirds of the

sales going to small and mid-size enterprises. The appeal to small and mid-size businesses is the apparent cost savings

they can realize by combining voice and data onto one network.

The transaction is expected to be

completed in March.

Over the past few months, 3Com has made a handful of strategic telephony announcements, including a joint venture with Siemens to develop LAN telephony and multimedia products for mid-size and large enterprises. ■

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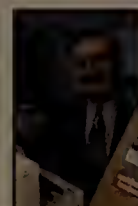
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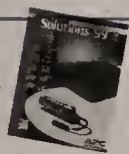
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Wired Windows . Dave Kearns

## Infrastructure

### THE HELP WE REALLY NEED

**T**he Microsoft antitrust case is still far from over, but most pundits have decided that Microsoft will lose. Having finished playing "You be the

Judge," the commentators are now playing "What's the Penalty?" Suggestions range from huge fines to a breakup of the Redmond behemoth.

Instead of speculating about legal issues, let's talk about government supervision of the computer industry. What could something like a Federal Computer Commission do to help consumers?

It could create a standard warranty for software and hardware overriding the ridiculous nonwarranty now used in

most software licenses ("Microsoft expressly disclaims any warranty for the software product. The software product and any related documentation is provided 'as is' without warranty of any kind, either express or implied, including, without limitation, the implied warranties or merchantability, fitness for a particular purpose, or noninfringement. The entire risk arising out of use or performance of the software product remains with you."). The warranty could specify that, at a minimum, the product should perform as advertised and as outlined in its manual and help files.

The commission could also set a standard for consequential damages. For example, if your software crashes my server, then you, the software vendor, are liable. Maybe we could have an independent panel oversee computer certification programs. Requirements would include a demonstrated proficiency with the product on which the user is being certified, not just the ability to give rote answers to questions.

But the one thing I'd really like to see is an official crash test for hardware and software products, similar to that used for cars. The results would be published so everyone could see which vendors provided the most reliable products. Seeing where Microsoft products rank on the list could go a long way toward reducing the company's monopoly of desktop operating systems.

Or perhaps Bill Gates will go on television, apologize for his inappropriate activities, then claim it was all about sex, and it's a private issue between Melinda and himself. The American public would claim to be satisfied, and the whole thing would just go away as we got on with the business of America. And "reset" would still be the button you were most familiar with on the front of your crash-prone Windows computer.

*Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at [wired@vquill.com](mailto:wired@vquill.com).*

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## Tip of The Week



Novell has closed one of the few gaps in Novell Directory Services (NDS) by reaching an agreement with ActivCard to support ActivCard's Smart Card technology. This directory-enabled product uses NDS to manage user access to network-based information and resources via ActivCard's integrated Corporate Wallet services, including convenient smart cards or token devices used to establish the identity of users. See [www.activcard.com/products/BMAS-ActivCard/index.html](http://www.activcard.com/products/BMAS-ActivCard/index.html) for further information.



# NT server vendors start taking on downtime risk

*Companies are guaranteeing that clusters of their machines won't fail — for a price.*

BY DENI CONNOR

Recognizing that more companies are relying heavily on their Windows NT server applications, server vendors have begun guaranteeing that the machines running those applications won't fail. While such pledges are commendable, they're not yet all they're cracked up to be.

The guarantees, which apply to NT server clusters, are similar to those offered by Unix server vendors. But the catch is that NT servers aren't quite as reliable as Unix machines — whereas Unix vendors guarantee 99.99% uptime, NT vendors' offers typically range from 99.5% to 99.9%, which translates into anywhere from nine hours to several days of downtime per year. What's more, an NT server uptime guarantee can cost a company more than the servers themselves, and most guarantees only apply to the vendors' top-of-the-line machines.

IBM is the latest vendor to join Compaq, Data General and Hewlett-Packard in signing up customers for uptime guarantee service contracts. Unisys will unveil a high-availability guarantee later this month for its Aquanta ES servers. Dell, which relies heavily on third-party support, has not announced any such plans.

Analysts commend the vendors for trying to put their money where their mouths are, but say they do face a challenge.

Currently, just 2% of NT server customers buy any sort of service agreement, according to International Data Corp., a Framingham, Mass., market research firm.

NT has robustness and availability issues that make guaranteeing uptime a risky proposition for server vendors, but demand for such guarantees should be on the rise, according to James Gruener, NT Server analyst for Aberdeen Group in Boston. "As more Windows NT applications become mission-critical, such as messaging, e-commerce and

databases, the need for them to be highly available has steadily increased," Gruener says.

A large retailer in the southern U.S. loses \$65,000 per hour when its e-commerce site is down, according to a company spokesman, who asked that neither he nor his

could stand to lose more than \$500,000 because of server downtime.

The retailer is using clustering technology called Endurance 4000 from Marathon Technologies, which takes off-the-shelf servers and links them via proprietary software

year. The retailer's system has been running without any downtime for more than a year, the spokesman says.

## Uptime ain't cheap

Companies that sign on with server vendors for uptime guarantees may suffer

year — not much less than the cost of the two-server clusters they protect. And users of these clusters must often qualify for the program and add extra services to the package, which can bring the cost of the service contract to more than \$300,000.

Under Compaq's offer, the vendor monitors its customers' server clusters remotely. When trouble occurs, the user has a dedicated technical account manager he or she can contact.

In the event of server downtime, vendors typically do not insure against lost data or employee time. Rather, they offer credits that can be used to reduce service costs.

"The customer needs to calculate the type of outages it can stand, and how much money it loses if its servers are not running. If the cost of the agreement itself is less than the downtime cost associated with it, then [downtime agreements] are worth it," Gruener says. ■

## Up and running

**Here is a sampling of uptime guarantees offered by server vendors for Windows NT server clusters. The guarantees apply only to certain machines, and in some cases, applications.**

Vendor	Program	Servers covered
Compaq	High Availability Services for Windows NT	ProLiant 3000s and 6500s
Data General	OmniiCare	Avilion 3650, 3700, 8600 and 8700 machines running SQL Server 7.0
Hewlett-Packard	Mission Critical Server Suite for Windows NT	NetServer LXr 8000
IBM	99.9% Availability Program	NetFinity
Unisys	Not announced yet	Aquanta ES

Note: All vendors guarantee 99.9% availability, with the exception of Compaq, which offers 99.5% to 99.9%.

company be named. So even if his company signed up for a server vendor's 99.9% uptime guarantee and the vendor lived up to it, the retailer

and hardware into four-way reliable, fault-tolerant clusters. Marathon offers 99.995% availability or less than 30 minutes of downtime per

a bit of sticker shock. Pricing for some, such as Compaq's 99.9% High Availability Services for Windows NT program, starts at \$20,000 per

## IN-SITE,

continued from page 15

Currently, the VPN is being used only by a dozen staff members, while other remote users go through an existing firewall.

The VPN users call their ISPs locally and use the Internet to hit an Altiga Networks C10 VPN concentrator that sits at the Internet threshold to the college network.

The concentrator challenges users for name and password, authenticates them and then grants access. Remote users have VPN rights restricted according to which ATM virtual LAN they've been assigned.

The VLANs are managed by two 3Com Cellplex 7000 ATM switches that anchor the campus backbone.

As more users from outside the college community seek access, they may be segregated by new VLANs, Turner says. He will also go to a separate Remote Authentication Dial-In User Service server to handle

authentication.

For example, a server to handle homeworkzone.com traffic might be assigned a VLAN of its own. User rights could also be set by class. So blocks of IP addresses could be assigned to each class, and IP filters could be configured to keep users out of LAN segments to which they are not authorized access.

Distributing VPN client software to remote users shouldn't be a problem, Turner says. Users whose machines are outfitted with Windows 95 or NT with Dialup Networking 1.3 will be able to establish an encrypted session over the Internet to the Altiga box via the Point-to-Point Tunneling Protocol.

For more sensitive traffic that needs stronger encryption, users will be able to download an Altiga client that supports the IP Security protocol with Data Encryption Standard (DES) and DES3 encryption.

Turner says the Altiga box handles up to 5,000 simultane-

ous sessions, and Altiga boxes can be stacked if traffic grows beyond that limit.

Turner says it took about an hour to install the Altiga box. "It's similar to configuring a PC on a local network," he says. List price for the concentrator is \$10,000.

Until the VPN was set up late last year, the school's remote access system con-

sisted of 32 modems used mainly for accessing e-mail and supporting terminal emulation.

Turner says the VPN is already being eyed to support a wider variety of applications, including filing electronic admissions applications, remote registration for classes and printing unofficial transcripts.

With enhanced security such as smart cards, Turner envisions the outside firm handling the school's payroll to access the administration database.

And Turner says he is already thinking about getting a second T-1 access link to the Internet from a different service provider. That would not only improve response times during peak loading, but it also would offer a diversely routed fallback if one of the links goes down. ■



Fitchburg State's Turner says installing Altiga's VPN box was a snap.





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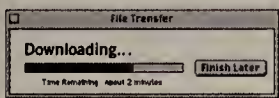
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INTEROPERABILITY

# Users: Standards bodies key to IP application rollouts

BY SANDRA GITTLEN

**B**rad Williams is not really a standards watcher. His job as senior telecommunications specialist at Pier 1 Imports, a large chain of retail stores, keeps him too busy to stay abreast of the standards bodies. But Williams and other network managers agree that while applications for running voice, videoconferencing and virtual private networks (VPN) over IP exist, they are almost useless without infrastructure standards.

Net managers say their top concerns are the lack of service guarantees for traffic running outside service provider networks, a dearth of true end-to-end security options and the multitude of disconnected telephony initiatives. And they think all these problems could be cured by standards.

Williams, whose company has a large frame relay network, had not been charmed by the lure of IP. He believes IP is not secure or stable enough to handle the chain's highly sensitive traffic needs.

"To roll out voice over IP and videoconferencing, you need quality of service," Williams says. "If you don't have QoS, then you can't guarantee the quality of that data."

The Multi-protocol Label Switching (MPLS) technology, which is making its way through the Internet Engineering Task Force (IETF), is expected to be the foundation for QoS on the Internet. MPLS is a traffic engineering technique that adds a label to IP packets. The label guides the packets through the Internet using pre-established paths. As a result, traffic is more predictable and scalable, which is critical for ISPs that offer users service-level agreements (SLA).

"MPLS is the most crucial standard that needs to be finalized this year," says Eric Hinden, senior analyst at The Yankee Group in Boston. "It's what is going to enable providers to roll out better services and SLAs for users."

Today's SLAs usually do not cover traffic that leaves a user's service provider network. But Williams says time-sensitive traffic can't be disrupted by an exchange between ISP networks. "Once the

***Sexy voice, videoconferencing and VPN applications could be thwarted by a lack of industry standards.***

data leaves your ISP, that ISP's not responsible for it," Williams says. "Well, who is?"

MPLS will solve this problem with a standard traffic-forwarding technology that all ISPs and gear vendors can implement. Riding on top of MPLS will be standardized classes of service that ISPs can offer as guaranteed service levels.

While IETF Chair Fred Baker says parts of the MPLS standard could be approved by the summer, ISPs such as GTE Internetworking say real-life implementations have to be tested before services can be rolled out.

Services aside, Dave Norton, a former systems administrator, says a more critical piece of the IP puzzle is security. Norton, who is a security consultant at distributed computing company Sprint Paranet, and other network managers are anxiously awaiting the IP Security (IPSec) protocol, which is being finalized by the IETF.

"The lure of the Internet for servicing remote users is too tempting not to consider IPSec," Norton says. He adds that today's security options are "cobble together," leaving users with a hodgepodge of security access points.

Unlike today's approaches that handle security through applications, IPSec tackles security at the network layer, when a connection is established. This allows for authentication of the user and encryption of data in one pop. Security can be set up without requiring changes to an end user's computer if the client supports IPSec.

All these security improvements make IPSec the logical choice for handling end-to-end security in VPNs. All the parts of the IPSec protocol will not be completed until summer.

But the need for end-to-end security brings with it some problems.

For example, IPSec requires packets to have unique IP addresses identified from host to destination. However, some net administrators are employing network address translators (NAT) to combat the dearth of IPv4 Class A addresses. NAT boxes sit in a network and dynamically assign IP addresses to packets from a pool of IP addresses. Because the addresses are neither unique nor constant, they blow holes in IPSec's security guarantees.

Dwight Gibbs, chief technical fool at online invest-

***"The lure of the Internet for servicing remote users is too tempting not to consider IPSec."***

Dave Norton, security consultant, Sprint Paranet



STEVE BORNIS

ment education company The Motley Fool, says this problem is fortuitous because it could speed the rollout of the plodding IPv6 standard. The next version of IP increases the amount of addresses that can be distributed, has built-in chargeback mechanisms to bill for traffic and, with IPSec, could feature built-in security.

"The IPv6 rollout has to happen," Gibbs says. "Internet growth is not going to be constrained by a lack of Class A addresses." The IETF's Baker agrees that IPSec might just be the fuel needed to light a flame under IPv6.

Net administrators are reluctant to make the switch from IPv4 to IPv6. They say it will take a lot of work, from changing network interface cards to redrawing network maps to reconfiguring hardware and software. Net managers also say there are not enough products requiring IPv6 to make it worth their while.

But Pier 1's Williams says he'd consider switching over if there were good tools on the market to help him. "You need something to do the translation between IPv4 and IPv6." ▣

***"Internet growth is not going to be constrained by a lack of Class A addresses."***

Dwight Gibbs, chief technical fool, The Motley Fool

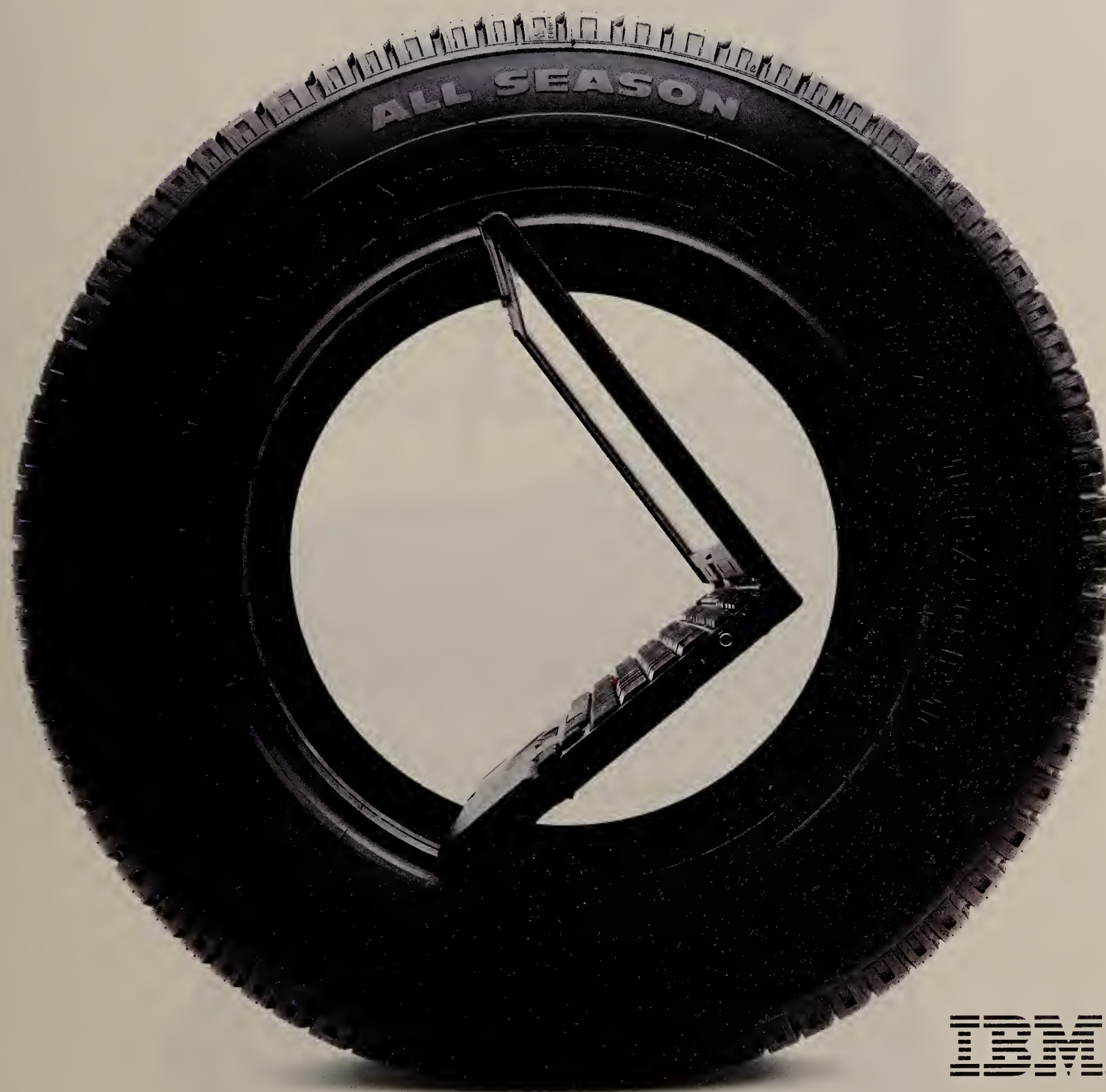


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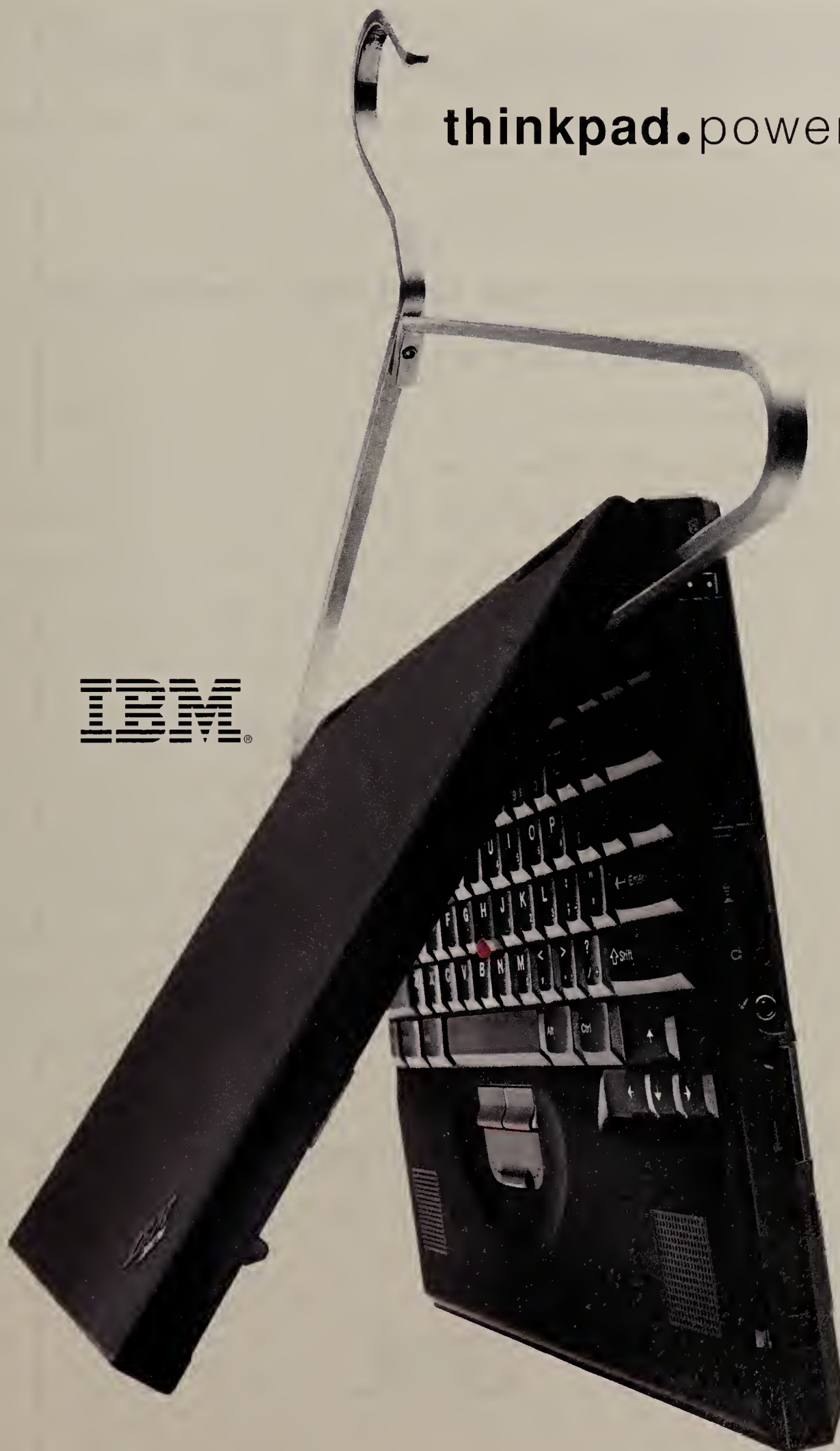
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# Carriers & ISPs

The Internet, Extranets, Interexchange  
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## Briefs

The Supreme Court last week allowed a class-action lawsuit against AT&T's mobile-phone billing practices to go forward. The suit by users in Washington state seeks to end AT&T's practice, common in the wireless industry, of rounding up toll charges to the next minute. The Supreme Court didn't rule on the case but dismissed AT&T's argument that only federal authorities can deal with mobile prices. As a result, a Washington court can rule whether the pricing practice is misleading. In wireline telephony, rounding up to the minute has become rare in business and less common for consumers.

Ameritech said last week it will acquire the data network design and consulting unit of Anixter for \$200 million. At the end of March, Ameritech will get 1,200 data networking integrators and designers from Anixter. Ameritech needs the additional personnel to meet business data demands, which the firm says grew 32% last year. Ameritech also gets the Anixter unit's business, making Ameritech the top U.S. carrier reseller of Cisco, Nortel Networks and 3Com data equipment.

WaveSpan this week will announce Stratum 100, a wireless access system that let users connect multiple Ethernet LANs within a 2.5-mile radius at 100M bit/sec. Stratum 100 will let users send voice and data traffic over the U-NII unlicensed wireless band. Because the wireless spectrum is unlicensed, users will not have to pay monthly bills to a service provider. While the Stratum 100 is based on wireless technology, WaveSpan says it is not adversely affected by bad weather. It will be available this month for \$44,950, with two antennas, two radios and two indoor units.

WaveSpan: (650) 919-0190

## Can EDS pull together MCI's back office?

BY DAVID ROHDE

JACKSON, MISS. — EDS is an old friend to MCI WorldCom CEO Bernard Ebbers. The outsourcing company has been doing the bulk of WorldCom's billing work and running much of its back-office systems for many years.

Now EDS faces the biggest challenge Ebbers has ever thrown its way — integrating and managing the former MCI's systems as well.

Ebbers earlier this month tapped EDS to all but take over MCI's IT infrastructure. As part of the move, Ebbers also sold the merged company's struggling outsourcing division, MCI Systemhouse, to EDS and arranged for the two firms to jointly sell and service large outsourcing contracts.

Turning over acquired networks to EDS is an old habit for WorldCom, analysts say. But the deal represents a big change for the MCI side of the house, whose 12,000 software engineers and other IT professionals have been the force behind the carrier's integrated billing, sales automation and specialized application projects.

The bulk of those employees will go to

### I'll trade you my IT for your network

Under the MCI WorldCom-EDS transaction, both companies get more of what they already specialize in:

- MCI WorldCom outsources its entire internal IT infrastructure and most of its applications development to EDS. **Value:** \$5 billion to \$7 billion over 10 years.
- EDS outsources the bulk of its global network to MCI WorldCom. **Value:** \$6 billion to \$8.5 billion over 10 years.
- EDS acquires MCI Systemhouse. **Value:** \$1.65 billion.
- EDS and MCI WorldCom to bid jointly on enterprise outsourcing deals. **Value:** To be seen.

EDS, while MCI WorldCom will receive 1,000 employees who ran EDS' WANs, as part of a giant asset swap (see graphic).

MCI WorldCom customers are bracing for a new round of transitions, particularly in the billing arena. Since the merger, billing errors have increased and resolution time has been dragged out to four or five months, says Andrew Stratford, director of telecommunications for Congress Financial, a specialized commercial lender in New York.

"There are too many unconcerned, too

many completely inept hands involved already," Stratford says. "I don't think the answer is really to change to a different [company]."

And while MCI WorldCom Vice Chairman John Sidgmore and EDS Chairman Dick Brown say their agreement to jointly sell and service out-

sourcing deals should boost revenue, they may have to watch out for poaching of existing Systemhouse and EDS customers by competitors.

"Almost all large, important outsourcing contracts have a change-of-control clause," says Rick Roscitt, president of AT&T Solutions, which analysts credit with besting MCI Systemhouse for recent big contracts. "I think a lot of their clients are dusting off their contracts and reading what they have. We're going to get a lot of calls."

Within MCI WorldCom, the biggest impact of the EDS deal will likely be on MCI's huge IT staff in Colorado Springs. Sidgmore and Brown did not rule out the possibility that a few employees may not find places in EDS.

EDS will have a big job ahead integrating MCI's systems with WorldCom's. "MCI's back-end systems are a mess," says Jim Freeze, senior telecom analyst at Forrester Research in Cambridge, Mass. Lance Boxer, former MCI chief information officer and now a division president at Lucent, said at the ComNet show in January that MCI still employs more than 100 billing systems.

MCI WorldCom does get the EDS net to add to its already huge collection of network facilities. EDS offers circuit-switched telephone, frame relay, ATM, private lines and managed bandwidth services, plus IP and very small aperture terminals. ■

## Project Oxygen to answer bandwidth demands

BY DENISE PAPPALARDO

HAMILTON, BERMUDA — There are vast differences between how enterprise users and service providers run their networks, but there is one problem they share: how to keep up with the increasing demand for bandwidth.

One plan, Project Oxygen, is expected to eventually help users and service providers. Project Oxygen is a network that will offer service providers network capacity, from 1.24G to 100G bit/sec, around the world. When it is completed in 2002, the net will link businesses in the U.S. with firms in more than 78 countries.

Project Oxygen is similar to the under-sea cable networks that carriers buy capacity from today, but those systems only provide point-to-point network capacity. Project Oxygen promises broadband access for a single price to all countries its net reaches.

But to achieve such lofty goals, developers need to drum up a lot of cash. Project Oxygen's Chairman and CEO Neil Tagare

first said he expected to have most of the project's funding by the end of last year.

The first phase of Project Oxygen is expected to cost \$10 billion. Of that, \$3 billion is expected to be in Project Oxygen's hands by the end of the second quarter, Tagare says. A total of \$1 billion will come from equity investments, and \$2 billion will come from bank loans.

A large portion of the remaining first-phase money will come from selling network capacity to service providers. Carriers can buy capacity on the Project Oxygen network for between \$10 million and \$200 million, but they will not be able to send traffic over the network until sometime between 2000 to 2002.

While these carriers don't have to put any money down, 40 have signed "memorandums of understanding," which state the service providers' intentions to buy capacity on the Project Oxygen network, Tagare says. He declined to identify any domestic carriers that have committed money to the project.

Project Oxygen: (441) 296-9999

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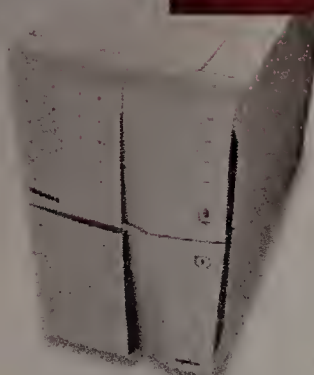


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Wan Monitor . Daniel Briere and Christine Heckart

## A DEN FOR THE BEASP

In our last column, we discussed what TeleChoice believes is the next big step in the evolution of networking: the Broadband Enabled Appli-

cation Service Provider (BEASP or ASP). The ASP will provide a package of applications, software, support and communications as part of an integrated ser-

vice. These services will probably be designed for specific customer groups or markets, and many will take the form of extranets that provide a complete method for connecting supply chains.

One important initiative aimed at consolidating services and applications is the development of Directory Enabled

Network (DEN). DEN is not yet a standard, but it is an open network architecture being developed by Microsoft and Cisco. It's intended to integrate a company's data network and directory to make nets easier to manage and grow.

A major benefit of DEN is the improved network intelligence that results when remote devices can swap information with other devices. Think of Star Trek's Borg. Alone, a Borg had limited intelligence, but every Borg knew the location and thoughts of every other Borg. So the Borg's ability to coordinate and direct resources in real time was exceptional.

In Kevin Kelly's book, *New Rules for the New Economy*, he discusses the power of connecting all things large and small to a global network. It takes something such as DEN to make this happen and to bring about the benefits to the economy and society Kelly describes.

DEN will also be used to usher in an era of policy-based networking. Use of network resources is profile-driven, providing the ability to identify a user and map him to a set of approved resources and security requirements. Why is this important? Today there is no good link between the net and user or application requirements. The important customer order from your Web site is treated the same as the spam you receive.

Extranet services will need a strict prioritization of network resources based on user, time of day, application or any number of factors. The glue for tying a user or device to a policy system and network resource is the directory.

DEN has the potential to be the signaling system for IP networks, linking policy management systems with network resources. Signaling will be a critical network component to the ASP because it helps link a physical network to a hosted application, thus forming a foundation for extranet and applications-based services.

But DEN isn't yet being worked on by the IETF. And although Cisco and Microsoft are throwing their weight behind DEN development and service providers, such as Qwest, are supporting it, there's still a lot of work to be done.

So what can you do to position yourself to take advantage of DEN when it arrives? Start organizing your net resources and business processes around directories. As you build directories, make sure they are Lightweight Directory Access Protocol 3-compliant and extensible. This will position you to take advantage of virtual private networks with early quality-of-service capabilities and position you to eventually exchange security and network resource information automatically between your local network and your WAN service provider.

Briere is president and Heckart is vice president of TeleChoice, a consultancy in Boston. They can be reached at [dbriere@telechoice.com](mailto:dbriere@telechoice.com) and [cbeckart@telechoice.com](mailto:cbeckart@telechoice.com), respectively.



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Presented by Mark A. Miller, P.E.,  
DigiNet Corporation



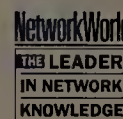
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- Understand the key driving factors behind the Voice over IP initiatives: client applications and economic benefits
- Realize the importance of implementation agreements and interoperability testing for a successful roll-out of these services
- Understand how the multimedia standards for audio/video coding, signaling, and call management fit together
- Understand how Quality of Service (QoS) issues become key factors for a successful multimedia network implementation
- Understand how network traffic patterns can impact a Voice over IP implementation
- Speak with representatives of sponsoring companies and see live demonstrations of desktop multimedia applications

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## Briefs

Security Dynamics Technologies next month will make its SecurID user-authentication product available on smart cards.



SecurID comes to smart cards.

The smart card support is the result of a technology agreement with smart card manufacturer Gemplus. The smart card version of SecurID, which will cost \$40, can be used for various applications, such as electronic badges for employee access.

Security Dynamics: (800) 732-8743

VeriFone's Internet credit card processing software products for merchants and banks, called vPOS and vGate, have passed compliance tests for the Secure Electronic Transaction (SET) protocol. The SET protocol was developed by MasterCard and Visa with backing from the high-tech industry.

Network management vendor Micromuse recently appointed Gregory Brown as chairman and CEO of the company. Brown succeeds Stephen Allott, who has been the company's interim CEO since October.

Allott will continue to serve as president and chief financial officer.

Brown served as president of Ameritech's custom business services division since 1996 and was president of Ameritech's new media division for three years.

## Trio tackles apps management

BY JEFF CARUSO

Network managers trying to determine how well their applications and networks are performing together will get some help from three vendors' upcoming products.

Apptitude will ship Visualizer probe, which tracks who is using corporate applications and how well the applications are performing. Envive has expanded its software for monitoring SAP R/3, and Concord Communications says it will license application management agent technology from FirstSense Software.

Application management is a good way to determine how much network capacity is needed, says Pat Rauchet, director of telecommunications at Sony Electronics, which is an early user of Apptitude's product. With Visualizer, the company saw how much traffic its critical applications were creating across some of its WAN links and found it didn't need as much WAN capacity as it had, Rauchet says.

Apptitude, formerly known as Technically Elite, is releasing Visualizer this month. Companies can deploy the probe

on critical links to identify application traffic moving at up to 100M bit/sec; determine which users are sending the most traffic; and view the traffic's impact on the net.

Apptitude, in San Jose, also offers a Web interface to display the data collected by the probes. In future releases, the company plans to enable Visualizer to measure the levels of service applications are receiving. Pricing starts at \$27,000 for two Visualizer probes and the Web interface.

Envive, of Mountain View, Calif., recently announced Collaborative Service Level Suite, which unifies the company's different software products for watching SAP R/3 applications. The suite includes Inspector 2.0, which monitors application events; Service Level Manager 2.0, which compares performance against

### Measuring applications

These vendors are extending their application management software:

Vendor	Product	Price	Availability
Apptitude	Visualizer	Starts at \$27,000	March
Concord	Network Health	Agent undisclosed	Second half 1999
Envive	Collaborative SLS	Starts at \$37,500	Now
Envive	Operations Datamart	\$10,000	Now

service-level agreements; and Stopwatch Pro 2.2, which measures response time. The suite is shipping now, with prices starting at \$37,500.

Concord, in Marlborough, Mass., will license agent technology from FirstSense in Burlington, Mass. FirstSense's agent runs on a client and measures how quickly the client receives responses over a network. Concord is developing an application, due in the second half of this year, which will use the agent to measure end-to-end application delays. The application will be used in Concord's Network Health reporting software. ■

## Outlook to peer into virtual meetings

BY JASON MESERVE

Users of Microsoft Outlook can now schedule voice and data collaboration sessions, thanks to MeetingPlace for Outlook from Latitude Communications.

Announced today, the software lets

users schedule resources on Latitude's MeetingPlace conference server from Outlook's scheduling agent. In addition to scheduling server space, the system sends out e-mail invitations to would-be attendees. The e-mail contains a link for point-and-click access to the virtual meeting. Outlook users can have their

calendars automatically populated with the conference details.

By integrating with Windows NT-based Web servers, MeetingPlace can generate an HTML page for each conference. The page contains access information and links to documents that are attached to the conference.

Latitude officials see real-time

conferencing as a natural progression of technology. "Groupware is limited to e-mail and discussion threads, so there is a need for real-time collaboration," says Michael Fratesi, group product manager at Latitude. "We see a natural interplay between real-time and asynchronous communication."

"[MeetingPlace for Outlook] will make things a lot simpler for us, especially on the help desk side," says Jon Holmes, MeetingPlace administrator for Cambridge Technology Partners. Holmes plans to roll out the software to approximately 4,500 employees.

MeetingPlace lets people share data in real time during a conference call. Conference attendees use the phone for the audio portion of the call, while data exchange is conducted over the Internet with Microsoft NetMeeting and document-sharing Java applets. For those unable to attend, MeetingPlace has the ability to record the session and maintain associated documents for on-demand replay.

Currently shipping, MeetingPlace for Outlook is available as a \$19,995 add-on to MeetingPlace conference server. Pricing for the server starts at \$100,000 for the typical enterprise deployment.

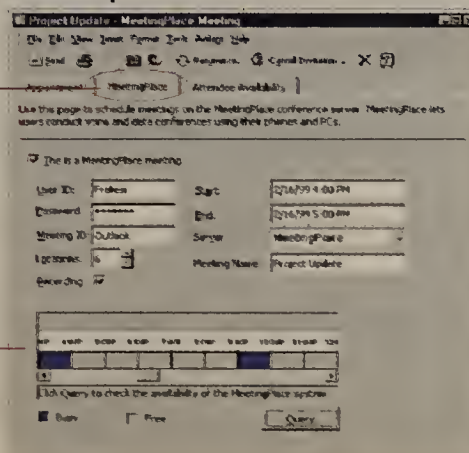
Latitude: (408) 988-7200

### Let's meet

Latitude's MeetingPlace for Outlook lets users schedule voice and data conferencing sessions on the MeetingPlace conference server directly from their desktops.

Added Outlook tab dialog for scheduling MeetingPlace resources.

Availability graph for the MeetingPlace conference server.





IN-SITE: *Lessons from Leading Users*

## Electronic forms ease prison charity's burdens

BY ROBIN SCHREIER HOHMAN

**W**hen Watergate conspirator Charles W. Colson founded Prison Fellowship more than 20 years ago, he probably didn't envision the paperwork involved in bringing religion to prisoners. Prison Fellowship has always been a grass-roots effort. One of its goals is to bring inmates and their families together, with the help of religion.

The group's most popular program is Angel Tree, a project designed to deliver holiday gifts to children of inmates. It's a six-month effort that includes 50,000 volunteers at 80 field offices and is coordinated with local churches nationwide. Naturally, there is an immeasurable amount of paperwork.

Paper forms are the key to the Angel Tree Project. Volunteers have to distribute the forms, 750,000 in all, to prisoners across the country. Prisoners then complete the forms with information about their children. The completed forms then go back to the local field offices, where they're sorted and sent to

churches near each child's home. Based on the information, parishioners at local churches buy and deliver presents for more than 500,000 kids.

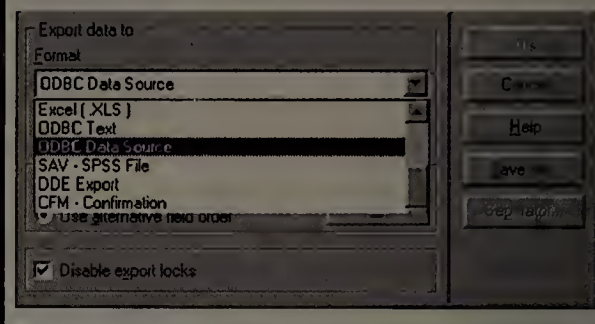
By Christmas 1997, the manual process had reached its limit, says Dave Fraedrich, director of application support at the Reston, Va., headquarters. Fraedrich says Open Technologies, a Phoenix value-added reseller, suggested he try automating the form processing with Cardiff Software's Teleform. Cardiff makes software that does optical character recognition and converts paper-based forms to HTML and other formats.

The results have been enlightening. Last year's pilot program in four states proved that Teleform will save volunteers thousands of labor hours each year.

The group now uses a high-speed Panasonic scanner that reads nearly 85 pages per minute. Each page is saved as a .tif image. The Teleform reader then extracts the data, interprets the characters and sends

### Easier forms

Cardiff Software's Teleform processes information from forms and stores it in a database, which can be exported to other files.



the page to a human verifier.

The organization upgraded the network to Windows NT with 100M bit/sec Ethernet connections. It stored the verified data on 300-MHz Pentium II servers with dual processors, with a 17G-byte RAID 5 array. The extracted data is sent back to field offices via e-mail.

Prison Fellowship can't afford to spend too much on the net. So why buy NT, when Linux is free?

"We have to stay to the center of the mainstream in computing," Fraedrich says.

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'Net Insider . Scott Bradner

## SOUNDS LIKE FAILURE

**A**n editorial on ATM in the February issue of *Business Communications Review* helped me to crystallize my thoughts on something that has been vaguely bothering me for a long time: Why do some ATM proponents sound like losers?

The editorial, "ATM: Networking's Swiss Army Knife?", is just the sort of thing I've been reading about ATM in many publications for the last few years. The editorial is an assertion that will be useful for something any day now. But somehow that day is always just around the corner, even though ATM is ready now.

The column ends by saying, "At least for now, however, ATM remains the only technology that has proven it can deliver Swiss Army knife-like functionality — a single package

that can be used for a multiplicity of purposes."

I've found this type of thing somehow disconcerting, though I did not know why. The editorial helped me nail it down. The ATM advocates are trying too hard.

I do not see the same sort of assertion of superiority from Gigabit Ethernet or IP advocates, though a bit of it creeps in from time to time on the token-ring front.

Devotees of most other technologies think it's better to heed Shakespeare's note that "words are not deeds." They talk about the things they have done rather than prophesy how great things will be in the future.

Even when focusing on success stories, articles about ATM somehow still come across as out of propor-

tion to the importance of the example. ATM proponents want readers to project some global impact from a small hospital installing an ATM network.

I do not know if this behavior is as prevalent in the ATM camp as I perceive it to be. I may be more sensitive to ATM marketing being presented in the form of news articles than I am regarding other technologies. If that is the case, it might be because I've been seeing it for a longer time with ATM than with other technologies.

When a technology finds its place in the landscape, the number of overhyped stories goes down, at least in the technical journals. At this point, marketing stories about IP or Ethernet would seem very much out of place and be seen as an

indication that the author did not know all that much about the topic. ATM has not reached that level of maturity in spite of years of work and after years of great success in a number of areas, including in ISP infrastructures.

It is a bit hard to understand why ATM advocates think they still have to try so hard. Maybe it's because they are unwilling to accept that ATM is good at what ATM is good at and still want to claim that it's the general purpose network tool.

Disclaimer: It's far too late for Harvard not to overhype. In any case, the above are my observations.

*Bradner is a consultant with Harvard University's University Information Systems. He can be reached at [sob@harvard.edu](mailto:sob@harvard.edu).*

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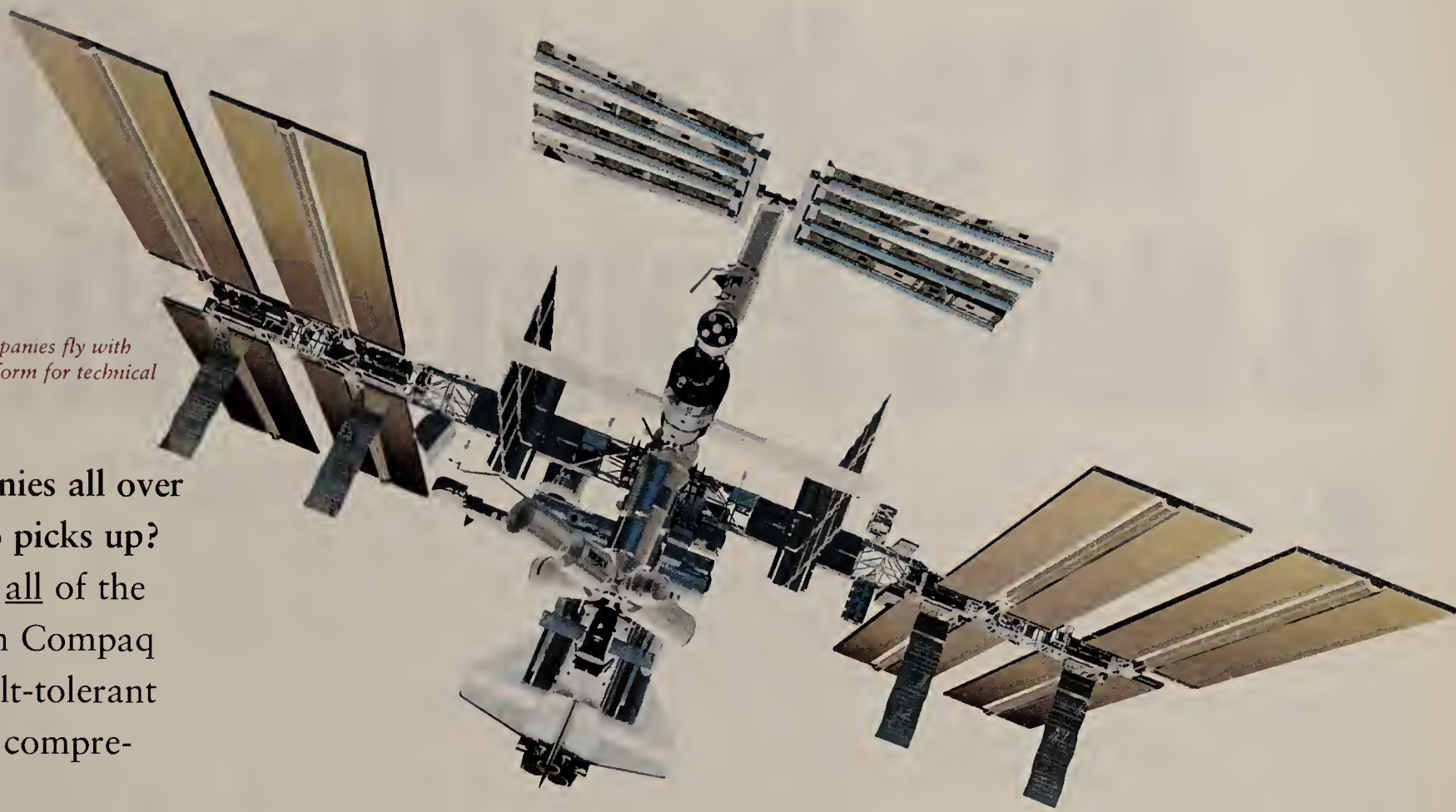
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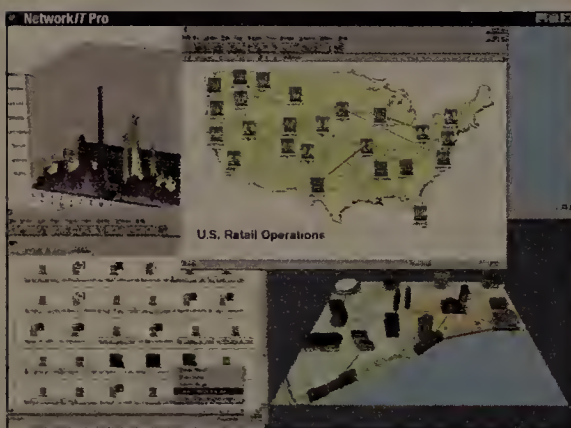
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# Technology Update

Evolving Technologies  
and Standards

## Ask Dr. Intranet

By Steve  
Blass

Is there some way to recover a lost or forgotten password on our intranet's Windows NT Web server? I don't want to re-build the system from scratch.

Via the Internet

You might be able to recover the password using L0pht Crack from [www.10pht.com](http://www.10pht.com). L0pht Crack conducts attacks on the Security Account Manager (SAM) database and may get you back into the system.

Another approach is to replace the password. A tool for this is available at [www.nmrc.org/files/snt/bootdisk.bin](http://www.nmrc.org/files/snt/bootdisk.bin). Download this file, and write the image to a floppy disk using the rawwrite.exe program available at <http://metalab.unc.edu/pub/Linux/system/install/rawwrite/rawwrite3.zip>. Boot the floppy on your NT server. It will load Linux, mount the NT File System (NTFS) partition and present an NT password-changing utility you can use to change the password on any account without knowing the password.

At start-up, you will be asked the locations of your NTFS partition and SAM database file and if you want to load the SCSI drivers. The NTFS partition is listed as type OS/2 HPFS. Then you will be given a list of accounts. Type in the name of the one to change and the new password. Upon rebooting NT, you may need to log on as "administrator" with a lowercase "a" until you reset the password again under NT. Caveat emptor: Be very careful with these tools.

As a network architect at Sprint Paranet in Houston, Blass understands the strain of developing and managing intranets. Send your problems to [dr.intranet@paranet.com](mailto:dr.intranet@paranet.com).

## Cable modems deliver fast 'Net access

BY PAUL NIKOLICH

Cable operators today are deploying cable modem technology that lets subscribers access the Internet over the same wires that deliver television signals at speeds 100 times faster than standard V.90 telephone modem technology — and without waiting for a dial-up connection.

In 1996, several cable operators commissioned the development of the Data Over Cable Service Interface Specification (DOCSIS) with the objective of establishing a single specification for equipment. DOCSIS covers all operational elements used in delivering data service to end users, including service provisioning, security, data interfaces and radio frequency interfaces (RFI). RFIs are the keys to cable equipment interoperability.

The architecture of the DOCSIS RFI consists of three major components: the Cable Modem Termination System (CMTS), installed in the head end, or main facility, of the cable operator; the hybrid fiber coaxial (HFC) cable network wiring infrastructure; and the cable modem, installed at customer premises.

In order for cable operators to deploy two-way data services, they must first upgrade their wiring infrastructure from one-way to two-way. Cable operators also install fiber optic cables from the head end to a fiber distribution node. These nodes distribute the signals to 500 to 2,000 homes, depending on configuration.

By using fiber optic cabling in the trunk section of a cable network, cable operators can reduce the number of amplifiers needed to complete a circuit between the head end and the end user, thus greatly increasing reliability and signal quality.

Cable modems are used to connect high-speed data pipes terminated in the cable operator's head end to the HFC infrastructure. The data connection is an IEEE 802.3-compliant 10M or 100M bit/sec Ethernet port on a router. The router can be connected to the Internet via a high-speed (T-1 or faster) WAN interface.

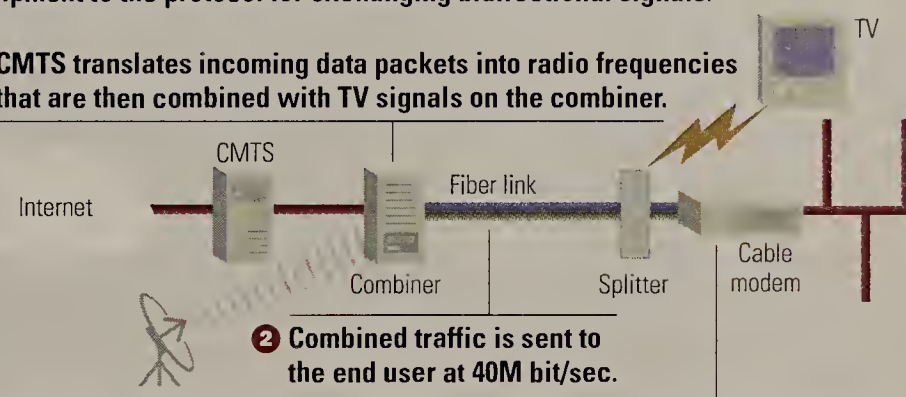
Cable modems translate Ethernet packets into radio frequency signals that are mapped into an unused 6-MHz television channel slot and broadcast to all the homes by the HFC node. The signal is received by any cable modems on the local LAN segment. It can travel anywhere in the downstream cable spec-

## HOW IT WORKS

### Data Over Cable Service Interface Specification (DOCSIS)

DOCSIS defines a broad standard for cable modem systems. The specification identifies everything from broadcast modulation technique and transmission equipment to the protocol for exchanging bidirectional signals.

- 1 CMTS translates incoming data packets into radio frequencies that are then combined with TV signals on the combiner.



- 2 Combined traffic is sent to the end user at 40M bit/sec.
- 3 Broadcast traffic is split off at end-user site by splitter and sent to the TV set. The cable modem converts remaining radio frequencies into Ethernet packets and sends them to the LAN.

trum, from 91 MHz to 857 MHz.

The downstream throughput of the cable modem can be 27M bit/sec or 40M bit/sec, depending on the quality of the HFC channel from the head end to the subscriber units.

The cable modem at the cable operator's facility receives signals from all the downstream cable modems on a different set of upstream frequencies in the 5-MHz to 42-MHz band. The throughput of this channel is variable, based on the quality of the upstream channel. Throughput varies from 160K bit/sec to 10M bit/sec. The DOCSIS architecture provides for one downstream channel to send signals to all cable modems, which may broadcast return signals on several different, nonoverlapping frequencies.

This allows the total throughput of the return channel to be increased by the number of independent return channels used. For example, the total maximum return channel bandwidth for four 10M bit/sec independent upstream channels would be 40M bit/sec.

The cable modem translates the downstream radio frequencies into packets, determines if the packets are destined for that particular cable modem and sends the packets along to a computer or a LAN on the client side of the cable modem.

This network connection is currently specified to be 10/100M bit/sec Ethernet, but alternative interfaces, such as Universal Serial Bus and PCI, are being

considered for lower-cost applications. The cable modem also receives packets from clients on the LAN and translates packets onto the upstream frequency to which they have been assigned.

A cable modem and its media access control protocol use contention mode and time-division multiplexing (TDM) mode. The cable modem allocates a certain portion of time for contention mode or TDM mode, depending on how the cable operator configures the network. Contention mode works well under a light load, providing low delay and high throughput when needed. TDM mode works well under a heavy load or in cases in which guaranteed throughput is desirable. The drawback of TDM is that the peak throughput is limited to the amount of bandwidth allocated to the cable modem.

In addition to the original DOCSIS specification, conventionally known as DOCSIS 1.0, upgraded versions of the specification are under development. These add features such as quality-of-service capabilities, which will enable the deployment of packet telephony across the cable infrastructure.

Nikolich is vice president of technology and standards at Broadband Access Systems, a Marlborough, Mass., developer of cable access platforms. He also is vice chairman of the IEEE 802 LAN/MAN Standards committee. He can be reached at [p.nikolich@ieee.org](mailto:p.nikolich@ieee.org).



Gearhead — inside the network machine . Mark Gibbs

## YOUR LOGO IS NO GOOD IF NO ONE CAN SEE IT

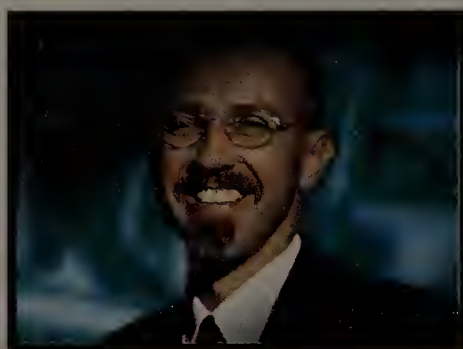
**T**his week's question is: "Can I see your logo?" If you've been involved with the World Wide Web, you'll have heard the term "browser-safe palette."

While you might have "grokked" the phrase — that is, understood it at a basic techie "I get the idea" level — you may not have had the time to find out what it really means. Gearhead is here to correct that.

A key objective in building your Web site is to display your organization, to show the world what you do and convey the value of your business. Central to that is looking good, and for your Web site to have that professional look it must be polished. This is where the browser-safe palette comes in — using it ensures that graphics look right.

The problem is that color rendition on PCs is a horrible, ugly compromise. At the top end of the professional computer display systems are "true color" displays that support a palette of 16,777,216 colors. Below that are what the majority of users actually have.

It turns out that the lowest com-



mon denominator for IBM PCs and Macintoshes is a 256-color palette. Even more restrictively, both operating systems reserve 40 of those colors for system purposes, leaving you with 216 colors to work with.

Now, the audience for your Web site might be using computer systems capable of rendering a gazillion colors. But for the rest of us that is unlikely to be the case. This means any images in our Web pages should use a palette that will work on different platforms if we want to have a consistent look.

This common palette is the browser-safe palette. If you use colors that aren't in this palette and your image is viewed on a 256-color monitor, the image must be modi-

fied. This is done either by you, so that you get the look you want, or dynamically by the browser. In the latter case, the results can be acceptable, but don't bet on it.

When the browser is left to its own devices, it makes a best effort to fix images. When it cannot render a color exactly, the browser converts to an approximation.

Now, say you have a corporate logo in which many close shades of green are adjacent. If none of the shades match a color that can be displayed, they will all be mapped to what will probably look, at least to a human, like the same color.

The result: a lake of a single color, completely wiping out the subtleties of the logo.

All major browsers use a palette based loosely on a scheme first developed by Netscape called the color cube. This model places the three colors — red, green and blue — on the edges of a cube and divides the range of each color into six equally spaced values. The six values break the cube into 6x6x6 sub-cubes that define a total of (surprise) 216 colors.

If you use an image in a Web page that has colors that are not in that palette, you force the browser to fake the color by dithering, a technique that uses groups of pixels of two close colors to approximate the target color. It works reasonably well for photographic images but can yield ugly results with line art, such as logos.

All professional graphics editors have the ability to select and modify the palettes of images, and most now support the browser-safe palette. Check out Photoshop ([www.adobe.com/prodindex/photoshop/](http://www.adobe.com/prodindex/photoshop/)) and Debabilizer ([www.equilibrium.com/](http://www.equilibrium.com/)).

If you are going to fine-tune the graphics on your site, I recommend the following books: *Creating Killer Web Sites*, Second Edition, by David Siegel, 1997, Hayden Books; ISBN: 1568304331; and *Coloring Web Graphics.2*, by Lynda Weinman, Bruce Heavin and Ali Karp, 1997, New Riders Publishing; ISBN: 1562058185.

Visibility reports to [gearhead@gibbs.com](mailto:gearhead@gibbs.com).



### Where's MAE-West?

Dan Lasater is MCI WorldCom's director of broadband applications and architect of the company's Internet metropolitan-area exchanges (MAE). So he has some interesting things to say about the state of the Internet.

Read our front-page feature on a day in the life of the Internet, then come online this week to exchange ideas with Lasater in

our forum:

*DocFinder: 1743*

### Revive your career

The doctor is in. Twice a month, our very own career doctor, Shaun Kelly, will be online to field questions about jump-starting your career, from how to ask for a raise to determining your net worth as an employee.

Kelly, a vice president at EDP Staffing, holds office hours this week in our online

career forum. You can post questions publicly or send him a private note, but no appointment is necessary (sorry, he doesn't make house calls):

*DocFinder: 1731*

### Tool of the week

Looking to hang a shingle on the Internet and start selling some products?

Intershop 3 Developer Edition helps developers build Internet storefronts, complete with shopping cart capabilities.

The tool uses its own template language extension variables to complement HTML, allowing dynamic data elements on standard Web pages to handle such features as shopping carts, inventory-level fluctuations and new product information.

Intershop 3 supports server-side scripting and multimedia page elements. Any HTML authoring tool

can be used in conjunction with the environment.

Intershop 3 is available for Windows NT 4.0 (Service Pack 3 required), Sun Solaris 2.5 or greater, SGI Irix 6.2 or greater, IBM AIX 4.2, HP-UX 10.10 or greater, and DEC Unix 4.0d. Download an evaluation at:

*DocFinder: 1736*

### Stuff you need to know

OK, OK, we should be staring hard at the monitor, fingers tapping keys at a lightning pace as we produce unparalleled amounts of high-quality output that will help the company bring in record profits this year.

But sometimes (just sometimes), those same fingers wander a little, and we get caught up in stuff we probably shouldn't.

Take, for example, Hamster Dance. The site, at [www.hamsterdance.com](http://www.hamsterdance.com), consists mainly of one page

with 300 animated GIFs of little dancing hamsters.

Yes, it's as dumb as it sounds (even more so if you turn your sound card up to hear the music guiding their dances). And yet, you sit there, mesmerized, watching them dance over and over again.

We hear it's been banned from the offices of at least one government contractor.

Then there's Stick Figure Death Theater. Oops, here comes the boss!

What are your favorite time-wasters? Let's build a list (and damn the torpedoes!):

*DocFinder: 1737*

### Building a bookshelf

A new network administrator is looking for advice on books and Web sites to help him come up to speed on overall network issues.

What would you recommend? Plus, see what other folks have suggested:

*DocFinder: 1642*



★ ★ ★ ★ ★ ★ ★ ★

# Tired of playing the Network Management Blues?

## Practical Solutions to Managing Enterprise Networks GETTING THE NETWORK MANAGEMENT PAYOFF

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president of Northeast Consulting Resources, Inc., on how to alleviate your network management blues, understand the latest technologies and find solutions that work in your environment. They know you're still wrestling with the challenges of network management systems, such as cost of ownership, complexity of use and implementations of real solutions. And they, along with leading network management vendors, are prepared to offer you some real solutions that will have you playing a new tune entirely.

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- ★ Develop a prioritized list of improvements you can apply immediately to your management infrastructure

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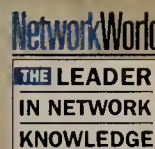
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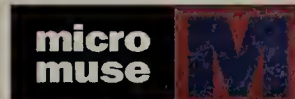
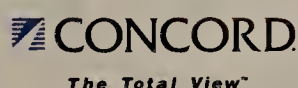
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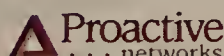


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## Editorial Insights

### The ATM Forum: Friend or foe?

I want to applaud the ATM Forum, but I just can't.

For years it has been fighting the good fight to establish ATM as the technology of choice for multiservice networks. During that time, detractors have complained that the group's work was flawed or politically-driven by vendor members with their own agendas. Naysayers said the group complicated ATM by coming out with so many specifications and directives that vendors and users had no idea what to implement.

But the forum stuck by its guns and reined itself in by announcing the Anchorage Accord in 1996, which set a baseline for future ATM technology development.

Now the group has astutely embraced IP. George Dobrowski, president of the ATM Forum, recently said the forum is helping to define a range of technologies to help IP and ATM better work together. One of the biggest things the forum is doing is working with the Internet Engineering Task Force to ensure that developing IP standards will work well with ATM standards.

This all sounds well and good, but the group lives in la-la land.

Its meetings are still closed-door — if you're not a member, you won't hear about the activities at ATM Forum meetings until weeks after, if at all. And the group's marketing arm seems nonexistent at a time when it should be at its most active.

The press is barred from going anywhere near most meeting sites. And even when we are invited to special press events at such meetings, as we were recently in Atlanta, reporters are kept well away from actual sessions. Lord knows what we might do if we were actually allowed to attend. Would work stop and the world come to an end?

Gut check, folks: The forum invited some 40 journalists to the Atlanta event, and three showed up.

Perception or circumstantial evidence can be a powerful force (ask Bill Clinton). The perception about the Forum is that it is still a closed membership doing some sort of secret work that few people care about. The Forum needs to change that perception.

— Michael Cooney  
mcooney@nw.com



## Message Queue

### PRIVATE LIVES

In his "Backspin" column about Intel's serialized processor chips ("Jump on the serialized bandwagon," Feb. 1, page 58), Mark Gibbs says, in essence, "Never fear, lots of other computers, such as mainframes and minis, already have readable serial numbers. It's no big deal, really!" However, mainframes and minis aren't personal devices. Lots of people use shared servers, so information collected about those servers doesn't shed light on the behavior of an individual. But once programmers get their hands on the unique serial numbers branded into our personal desktops, those serial numbers will begin appearing in all sorts of databases, letting people collect and exchange profiles about personal computing habits.

Gibbs says a serialized CPU is no more dangerous than the Ethernet address on a PC. But the Ethernet address is alterable on many network interface cards, and in most organizations Ethernet cards hop from machine to machine like fleas on dogs. Nobody uses the Ethernet address as a tracking ID because it's not reliable. Intel says its CPU serial number is immutable, which is just what the snoopers are lusting for.

I don't think the Electronic Privacy Information Center is being at all premature in calling for a boycott of Intel products. If we don't stop Intel from serializing CPUs, we can all kiss our desktop privacy goodbye.

Mel Beckman  
Ventura, Calif.

Mark Gibbs claims we have a long way to go before processor serial numbers become like Social Security numbers. But that seems to be how Intel is advertising processor serialization. To me it sounds like Intel is planning to broadcast these serial numbers every time you visit a Web site. That makes processor serialization more powerful and more dangerous than my network interface card (NIC) address or TCP/IP address. And if my NIC address is unique, what do I need a processor serial number for, anyway?

Send letters to [nwnews@nw.com](mailto:nwnews@nw.com) or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

More  
**Online**

- More letters on Intel's serial number controversy.

DocFinder  
FIND IT **1739** ON FUSION  
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nw

Has Intel announced any productive use for this serial number? The only uses I have heard about so far are Web tracking and copyright protection. Are there any uses that actually benefit the user?

Security is almost a moot point. It's just another number that would be added to an encryption scheme. And if Intel lets Web sites capture the number, how is that any more secure than what we already have?

Sounds to me like Intel doesn't yet know what it wants to do with this thing. All I know is if it has no clearly defined purpose or value to the end user, I don't want it.

Chuck Noyes  
Boston

### THE NEW NOVELL

Your article "Novell Reborn" (Feb. 8, page 1) was an excellent piece of industry journalism: well researched and comprehensive. It's great to see Novell getting positive front-page press on Novell Directory Services and its rebounding market share. I hope more and more people come to realize that what Microsoft does best is marketing and not software development.

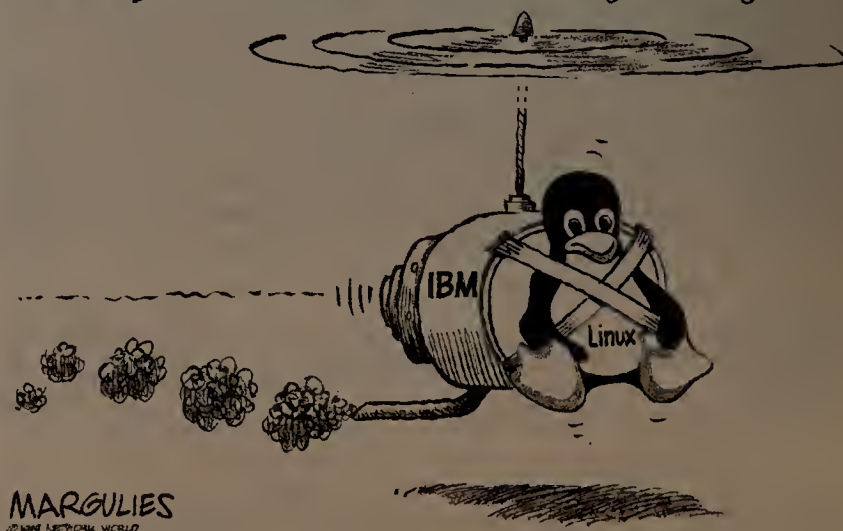
Neil Conner  
Network manager  
Mineral Resources Development  
San Mateo, Calif.

Just wanted to compliment you on the thoroughness of your article on the rebirth of Novell; it was definitely well-written and informative. Believe it or not, there are still a lot of shops out there that are using multiple platforms and somehow managing them all with limited staff. Anything positive on Novell is more ammunition I can use to convince management to stick with our current Novell servers and upgrade rather than migrate to NT.

I prefer the user-friendly Novell Directory Services structure; however, I haven't been given the opportunity to try Novell NetWare for NT on an existing NT server.

Chandra Griffin  
Harrisonburg, Va.

### Great Moments in Evolution: Penguins develop the ability to fly





## BREAKING UP WITH YOUR ISP NEED NOT BE HARD TO DO

**B**ad business is popular in the Internet world. Even the largest companies are not immune. Case in point: USWest.net, the ISP owned by US WEST, offers a dedicated 128K bit/sec ISDN line with static IP addresses for \$80 per month. But USWest.net has to buy the ISDN service from US WEST for \$112 per month in addition to the cost of equipment, billing and support people. So it's losing money on every line. Perhaps the ISP hopes to make up for the money loss in volume.

This kind of fiscal foolishness doesn't even make people blink in the Internet business. After all, you have to lose money to make money — or at least to have your stock price skyrocket.

Stock prices are a powerful force. I sit on the board of directors of a small ISP that was recently targeted for acquisition. The acquiring company's business plan was: Buy a lot of small ISPs; sit around, trying not to lose money; and get bought by AT&T, MCI, Sprint or America Online. With this strategy, everyone makes money because the stock goes through the roof.

Well, this is the U.S., and that's certainly one way to make money. But one component of the equation was never mentioned: the customer.

When an ISP gets bought or goes broke, customers almost always suffer. Sure, there are rare cases in which the ISP was so destitute that getting bought was the only way out of Chapter 11 and things do get better. But that's the exception, not the rule.

What can you do to ensure that you don't end up with an ISP that's about to get bought or drop out? Unfortunately, not much. ISPs are acquisition targets, and many of those that don't smell the lure of easy money will turn up in bankruptcy court. However, you can build your connection so you can move to another ISP without unduly upsetting your users. Here are some hints:

- Avoid dedicated circuits, such as T-1s. Look for a connection that goes over a public network, such as frame relay or ISDN. Adding a new permanent virtual circuit to a frame relay circuit can be done in a day; replacing a dedicated T-1 can take a month or more.

- Write an escape clause into your contract. Sign up for five years to get a nice price break, but include a clause that lets you get out if you (and you alone) find that service or support is below an acceptable level.

- Gain IP address independence. Use technologies such as Domain Name System, Dynamic Host Configuration Protocol and even Network Address Translation to ensure that it doesn't matter what your IP addresses really are. If you think that re-addressing would require, at most, a painful Saturday, you've done a good job. If renumbering your system is too painful to consider, your ISP may have you in a hammerlock. And if you're big and wealthy, you can get IP addresses that don't belong to any ISP — and that's the best situation.

*Snyder is a senior partner at Opus One, whose dial-up account got sold by Sprynet to CompuServe to AOL to Mindspring, at which point it was time to get a new ISP. He can be reached at [jms@opus1.com](mailto:jms@opus1.com).*

## MAKE SURE YOUR CORPORATE WEB SITE IS LAWSUIT-PROOF

**M**anaging your corporation's Web site has gotten more complicated, thanks to a recent lawsuit from Planned Parenthood. Last month, a U.S. district court in Oregon ruled that a Web site run by an anti-abortion group can't list the names of doctors who perform abortions. These lists included the following legend: "black font = working; grayed-out name = wounded; and strikethrough = fatality." (For example, the name of Dr. Barnett Slepian, murdered last year in his home outside of Buffalo, N.Y., had a strike through it.) In addition, the anti-abortion group has been ordered to pay Planned Parenthood millions of dollars in damages.

The First Amendment to the Constitution guarantees freedom of speech. In the past, threats to individuals have been excluded from this protection, rightly so in my opinion. No one should be allowed to shout "fire" in a crowded theater. But we get into trouble when we try to extend this analogy to the World Wide Web.

The Oregon ruling indicates that naming an individual on a hate site constitutes a threat, and others seem to agree. Pennsylvania Attorney General Mike Fisher has said, "Free speech does not give you the right to threaten to kill someone, whether it be through the mail, in person or on the Internet." Fisher has his own lawsuit, still undecided at this writing, against another hate group publishing threats on the Web.

Both the Oregon and Pennsylvania cases spell trouble for corporate Webmasters. Here's why.

Most corporations have more than one individual posting information to their Web site. Few have



any formal policy to educate these Internet authors as to what is and isn't appropriate information to distribute. And it's getting stickier to determine what is and isn't appropriate.

For example, several years ago a Webmaster was fired because he included at the bottom of the corporate Web page a link to his personal site. The entire link consisted of a single period at the end of a sentence — you had to look really hard to find the tiny blue line underneath that period.

But by and large, the vast majority of corporate Web sites are thankfully far from the *Sturm und Drang* of most hate sites. Your corporation probably doesn't incite people to take the law into their own hands, call for anyone to be brought to justice or post the home addresses of people it considers bad guys. That's great, but you need to take further steps if you want to avoid nasty legal battles down the road. Here are some suggestions.

- Remind your Web staff that anything they post

can and will be held against your company legally. So make sure anyone who is allowed to post information to your site understands what's harmful and what's not. I am not saying that every line of HTML needs a legal review, but just a few common-sense policies should help.

- Have an explicit policy stating what type of information is and isn't permitted on your site. Make sure you are clear about how personal information can be displayed and what external sites you intend to link to.

- Establish and maintain a regular schedule for updating pages to make it easier for management to review the changes.

- Ensure you have tight control over who is allowed to update your site.

When I first heard about the Oregon ruling, I was initially elated to see those responsible punished for distributing hate speech. My elation turned into concern the more I thought about this case. As much as I detest hate sites, I think this ruling has dire implications down the road for corporate Webmasters, even if content is considered quite bland. It increases the chances that someone will sue you over information on your Web site, and that is nasty business indeed.

*Strom is the founding editor in chief of Network Computing and co-author of the book Internet Messaging (Prentice Hall, 1998), and publishes his Web Informant essays at [www.strom.com](http://www.strom.com). He can be reached at (516) 944-3407 or [david@strom.com](mailto:david@strom.com).*



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# A DAY IN THE LIFE OF THE INTERNET

Continued from page 1

On Tuesday, Jan. 19, *Network World*, in conjunction with parent company International Data Group's News Service, dispatched reporters to eight of the major crossroads for Internet traffic, known as network access points (NAP). The idea was to gain an inside look at the people and places at the core of the Internet backbone.

Consistent with the highly decentralized nature of the Internet, we found that in many respects the NAPs are very different. Some are located on college campuses, others are in corporate high-rises. Some NAPs are run by nonprofit organizations that offer their services for free, while others are run by major telcos that charge thousands of dollars per month in connection fees. Some have staffers on-site 24 hours a day; others are managed remotely. Some use FDDI for their backbones; others rely on Gigabit Ethernet or ATM.

But there are similarities among NAPs as well. They all serve the same basic function — to act as neutral byte bazaars where ISPs can swap packets with other ISPs based on specific protocols and traffic levels. NAPs



**SFINX handles 70% of the Internet traffic generated in France, and Franck Simon helps ensure it gets through without a hitch.**

don't get involved in the haggling that leads to the public peering agreements between ISPs; they simply move traffic.

Security is tight at all the NAPs, befitting their importance. The guts of all the NAPs look remarkably alike no matter where they are — drab rooms crammed with jumbles of cables and tall racks of routers and switches. And the network managers who operate the NAPs share a quiet confidence that they have the bandwidth, the backup systems and the network monitoring tools to weather any storm and keep the Internet humming.

## The day dawns in Tokyo

As the Shintamagawa line pulls out from a train station near Yokohama,

Yasushi Sano finds a seat. It's 7:30 a.m., and the engineer settles in to sleep for the hour-and-a-half ride to work.

Sano, who heads the technical staff at Japan Internet Exchange Co. (JPIX), is first to arrive at the office. He's followed closely by Marketing Chief Toshiki Ueda and the nine others who oversee Japan's only NAP.

Created in 1997, JPIX is a cooperative effort funded

## A day in the life of the Internet

Glimpse inside eight network access points (NAP) around the globe that serve as the lifeblood of the Internet and shoulder the weight of all that traffic.

The Internet is one unruly beast, with hundreds of providers connecting to each other in various ways. But NAPs bring a measure of calm and stability, offering secure, reliable connections among ISPs. Although the eight NAPs we visited around the globe differ in terms of look, feel and size, the people behind the NAPs share a quiet confidence that they have what it takes to keep the Internet humming.

by top Japanese ISPs and equipment companies, including AT&T, Fujitsu, NEC and Kokusai Denshin Denwa Co. (KDD), Japan's largest international telco.

JPIX is located in the KDD building in Otemachi, the Tokyo district that is the heart of Japan's financial world. It's Tuesday, and JPIX has a weekly company meeting at 10 a.m. As staffers sip cold tea, Sano outlines a schedule for readying JPIX's systems for 2000.

After the meeting, Sano and Ueda return to their cramped workstations. They monitor switch activity from browsers on their desktops. A chart displays the traffic volume of NEC's BigGlobe Internet service, while blinking dots representing router ports show JPIX's activity in real time.

The 19th floor office has a view of downtown Tokyo that stretches all the way to Tokyo Bay. On a clear day, Ueda sometimes scans the horizon with binoculars kept on the windowsill. But today the sky is overcast. Sano and Ueda have a quiet lunch at their desks, the mood of

## The NAPs at a glance

### London Internet Exchange (LINX)

**Location:** Telehouse, a secure telecom and ISP site  
**ISPs connected:** 50  
**Core technology:** Gigabit Ethernet  
**Connection cost:** About \$16,350 to join plus \$19,600 per year  
**Jan. 19 traffic peak:** 400M bit/sec.

### Amsterdam Internet Exchange (AMS-IX)

**Location:** SARA, a national computing center  
**ISPs connected:** 52  
**Core technology:** Ethernet  
**Connection cost:** About \$560 to \$950 per month depending on speed  
**Jan. 19 traffic peak:** 161M bit/sec

### Chicago NAP

**Location:** Ameritech building, Chicago  
**ISPs connected:** 60  
**Core technology:** ATM  
**Connection cost:** Starts at \$4,500  
**Jan. 19 traffic peak:** 1.8G bit/sec

### Japan Internet Exchange Co., Ltd. (JPIX)

**Location:** Kokusai Denshin Denwa (Japan's largest international telco) office building, Tokyo  
**ISPs connected:** 20  
**Core technology:** FDDI  
**Connection cost:** \$10,000 per month  
**Jan. 19 traffic peak:** 320M bit/sec

### MAE-West

**Location:** MCI WorldCom building, San Jose  
**ISPs connected:** 75  
**Core technology:** FDDI/ATM  
**Connection cost:** Not available  
**Jan. 19 traffic peak:** 1.9G bit/sec

### MAE-East

**Location:** MCI WorldCom building, Vienna, Va.  
**ISPs connected:** 77  
**Core technology:** FDDI/ATM  
**Connection cost:** Not available  
**Jan. 19 traffic peak:** 2.1G bit/sec

### Service for French Internet Exchange (SFINX)

**Location:** France Telecom building, Paris  
**ISPs connected:** 36  
**Core technology:** Ethernet  
**Connection cost:** About \$7,000 per year for hosted connection, \$14,500 for managed  
**Jan. 19 traffic peak:** Not available

### Hong Kong Internet Exchange (HKIX)

**Location:** Chinese University of Hong Kong  
**ISPs connected:** 50  
**Core technology:** Ethernet  
**Connection cost:** None  
**Jan. 19 traffic peak:** 60M bit/sec



after calm a testament to the stability of the JPIX system. In fact, Sano carries a pager so he can be reached on weekends and evenings, but he says he has never been called in for a crisis.

JPIX traffic peaks at 320M bit/sec every day around midnight, when users are home from work and access rates are the least expensive. The second peak arrives between noon and 1 p.m., when workers surf the 'Net during their lunch breaks.

"You can see how dedicated the Japanese are to their jobs," Ueda says, pointing to a graph that shows traffic plummeting after 1 p.m. "They quit playing on the [World Wide] Web and get back to work," he says with a laugh.

At the core of the exchange are four FDDI-based



Andy Schmidt says Ameritech's NAP may soon provide direct Internet access for large corporations, enabling them to bypass ISPs. "We're starting to cross the threshold where a different business model makes sense," he says.

Compaq Gigaswitches. The switches, which each have a capacity of 3.4G bit/sec, sit next to banks of wiring closets that hold cabling panels and Cisco Catalyst 5000 Ethernet switches that support connections among 20 ISPs.

Sano heads home around 6:30 p.m. His cohorts in Hong Kong, which is just an hour behind Tokyo, will soon be doing the same. At just about that time, network managers at key European NAPs are arriving at their offices.

## It's academic in Hong Kong

If the Japanese NAP is urban and corporate, the Hong Kong Internet Exchange (HKIX) is just the opposite — rural and academic. Since 1995, it has been run by the Computer Services Center of the Chinese University of Hong Kong, located in Shatin in the New Territories.

Like other NAPs outside the U.S., HKIX's goal is to keep local traffic local. If HKIX didn't exist, the 50 participating ISPs, including AT&T, China Telecom and UUNET, would have to bounce intra-Hong Kong traffic to a NAP in the U.S., which would be cumbersome and costly.

HKIX offers its services free, but it may soon be forced to begin assessing fees following recent cuts in the university's budget. However, the scene at HKIX is highly professional — more like an end-user company than an academic establishment.

A large, sparsely furnished, well-lit room in the university's computer center contains the exchange's switch and routers, which are housed in glass-fronted, cream-colored cabinets. The core of the exchange's system is a Cisco Catalyst 5500 switch and a Cisco 7507 router. To join the exchange, ISPs are required to

lease at minimum a dedicated T-1 line and set up a router at the university.

HKIX has grown quite a bit over the past few years, says Che-Hoo Cheng, who heads the NAP. When HKIX was first established, a coaxial cable was used to interconnect the routers. Over time, the exchange graduated to an unshielded twisted-pair hub, then a Cisco Catalyst 3000 switch, a 5000 and now a 5500. The router was upgraded from a Cisco 2501 to a 7507.

HKIX's two engineers, Walter Lee and Y.L. Yeng, spend most of their time on the university's network but squeeze in a few hours each week to ensure the NAP is running smoothly. "We just monitor our switch, it's a very minimal workload," Yeng says. In addition, three shifts of network operators provide round-the-clock coverage at the NAP, monitoring traffic and responding to customer calls.

Typical of the way NAPs fit into the Internet architecture, HKIX doesn't send traffic to, or even engage in regular communications with, any other NAP. However, HKIX does stay in close contact with the island's participating ISPs, sending them the latest router performance data.

HKIX is one of the smaller NAPs, with traffic peaking at about 60M bit/sec around midnight, far below network capacity of 3.6G bit/sec.

Lee and Yeng agree that the Internet is quite stable. "The whole Internet is not the responsibility of one party, it's the result of cooperation between different parties," Yeng says. Even if the Hong Kong NAP failed, the island's larger ISPs have their own direct connections to major U.S. NAPs, so traffic could easily be rerouted.

## Amsterdam is up and coming

Around the time JPIX's Sano is heading home on the train from Tokyo, a blustery winter day is dawning in Amsterdam. Peter Huizer, who watches over the Amsterdam Internet

Exchange (AMS-IX), glides along raised dikes on his heavy black bicycle. Locking up his transport at the doors of SARA, a national computing center serving several Dutch universities, he files into a low brick building for the day's first cup of black coffee.

Huizer and his team of network engineers have a busy day ahead, monitoring traffic for the 52 ISPs connected to AMS-IX, the only Internet exchange in the Netherlands, and managing SARA's academic and private nets.

AMS-IX is not much more than two rooms full of gray cabinets that house the routers of member ISPs. Today, the Cisco Catalyst 5000 switch that lies at the core of AMS-IX will process traffic at an average of 182M bit/sec. While traffic tripled on AMS-IX last year, the network is nowhere near capacity, says Huizer, academic computing services manager at SARA. Currently, it runs at about 10% capacity during peak times, which correspond to European business hours and a two-hour stretch in the evenings.

The way AMS-IX is set up, ISPs connect their routers via 10M or 100M bit/sec Ethernet links to one of the two Cisco Catalyst 5000 switches, which, in turn, are connected by a primary Gigabit Ethernet link and a backup Fast Ethernet link. One switch lives in a cabinet at SARA, the other across the road at NIKHEF, operator of a national physics research network.

As an association, AMS-IX has only been in existence for one year, but it has been an exchange of sorts since 1992, when three ISPs were connected with a thick yellow Ethernet cable at the science park where SARA and NIKHEF are located. Today, the

ISPs include @Home Benelux, Planet Online, AT&T, Demon Internet and EUNet.

SARA network engineers are on duty from 8 a.m. to 8 p.m. to handle calls from ISP members. After 8 p.m., the burden of support falls on the person unlucky enough to be on beeper duty.

But with AMS-IX's track record of nearly 100% uptime, there aren't many ISPs that call with problems, Huizer says. The only crash occurred last year when a power grid failed in the early morning hours. The exchange was back in action three hours later and no ISP had complained, probably because most customers were still asleep.

## Paris, home of the SFINX

How's this for tight security? Everyone who enters the French NAP, located in a France Telecom building on rue de la Banque in the heart of Paris, has to hand over his passport to a security guard who sits behind a thick pane of glass.

In France, the NAP, which is called Service for French Internet Exchange (SFINX), is run by a state agency that subcontracts the day-to-day operations to France Telecom.

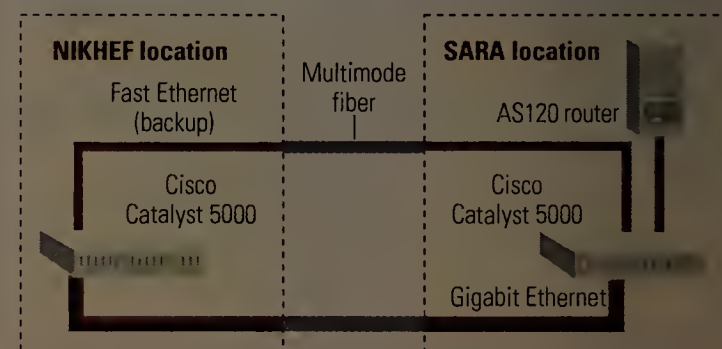
SFINX, which carries 70% of the Internet traffic generated in France, is located on two floors in the France Telecom building. Managed clients are on the seventh floor, where no one but France Telecom personnel are allowed. Hosted customers — who install, configure and maintain their own equipment — have access to the ground floor of the building.

Hosted ISPs have a choice of a 10M or 100M bit/sec Ethernet link, while managed clients get a 10M bit/sec connection to the NAP. All hosted ISPs monitor their own traffic, but Renater, the state telecommunications agency that runs SFINX, also monitors everyone's traffic using home-grown quality-control applications, says Franck Simon, SFINX operating director.

The exchange is monitored in two shifts: 7:30 a.m. to 7 p.m. and 7 p.m. to 7:30 a.m. The busier daytime shift is manned by a minimum of two engineers. But

## It's Ethernet in Amsterdam

At the Amsterdam Internet Exchange, ISPs can connect to their choice of two Cisco Catalyst 5000 Ethernet switches, which are located in buildings across the street from each other.



similar to the other NAPs, the mood is relaxed. Things run well enough that there is little to do on SFINX's behalf, one casually dressed technician says, other than keep an eye on the routers' green lights and on the SFINX customers who come from time to time to maintain their equipment.

And like the other NAPs, growth has been startling. When Renater started SFINX in 1994, it had one switch and three managed customers. A second switch was added in 1996, and the third Cisco switch came in 1997. Today, 36 ISPs connect to SFINX; Renater declines to give the network's capacity other than to say it could accommodate as many as 60 ISPs.

For now, the equipment in place is sufficient to handle all of SFINX's needs. But with an eye to the future,





Jan. 19 was a fairly quiet day at MAE-West. As Dan Lasater put it, "You don't see anybody running around with their hair on fire."

Renater plans to launch SFINX 2 later this year.

Renater Director Dany Vandromme has no doubt that SFINX will keep up with customer demand. He isn't so sure, however, that his smaller customers will survive. "Big operators peer with one another, but some won't even talk to the small operators. Within a few years, there may be nothing but big operators left," he warns.

## Lonely in London

Getting past the three layers of security at Telehouse, where London's Internet Exchange (LINX) is housed, is a challenge akin to breaking into James Bond's M.I. 6 headquarters.

A history here of terrorism, flooding and the fear of power outages and natural emergencies led to the creation of a state-of-the-art secured building that houses a number of telcos and ISPs. The several layers of reinforced glass security doors that require pass cards and pass codes to enter testify to the significance of what is housed within.

For here, along with a presence by all major European and U.S. telcos, are found the switches and routers through which more than 90% of all domestic U.K. Internet traffic passes.

Today the only human around is engineer Jerry Reilly, whose makeshift, fold-out desk, holding a tiny laptop, protrudes from one of the racks. He is here only at a reporter's request. Normally, he would be at LINX's office in Peterborough, about a 90-minute drive from London, because almost any problem can be solved remotely.

Indeed, no one works on-site. Rather, three engineers, who split a 24-hour shift, are notified via their mobile phones if a problem arises; they rush over or, more likely, solve the problem remotely. If the engineers can't be reached, a Telehouse staff engineer can fill in.

The LINX suite in Telehouse is only about 15 square meters, and every bit of it, except for aisle space, is stuffed with racks holding switches and other equipment. The core of the exchange is a Packet Engines 5200 Gigabit routing switch. This behemoth can more than handle the traffic that comes through the NAP, says Keith Mitchell, executive chairman of LINX. Providing backup for the 5200 are two Plaintree Systems WaveSwitch 4800 switches and two Cisco 5000 switches. The system accommodates 70 ports, and there are currently 50 ISPs connected to LINX.

This configuration can easily accommodate even the busiest time, which is typically around 2 p.m., when the traffic load reaches around 400M bit/sec. The traffic load is about the same every weekday, lighter on weekends.

In fact, LINX has never gone down. There were two minor incidents caused by a Telchouse employee who accidentally switched off the power supply, but Mitchell says no one completely lost service.

## A global gateway in Vienna, Va.

With a technical staff consisting of two ex-G.I.s and a former state cop, MAE-East is ready for anything. Can it handle 60% of all European traffic? Bring it on. How about 40% of all U.S. traffic? Is that all you've got?

"We've got plenty of bandwidth, and we're ready to go," says former Army engineer Mike Carroll, lead technician for MAE-East, the NAP operated by MCI

WorldCom in a glass-fronted office building outside of Washington, D.C.

The name MAE, or Metropolitan Area Ethernet, dates back to 1992 when MFS Communications built the first NAP for ISPs. MCI WorldCom, which bought MFS, now operates eight MAEs in the U.S. MAEs East, West and Central are considered Tier 1, or national, NAPs, while the other five are Tier 2, or regional, NAPs.

While the NAPs in France and Japan are designed to keep traffic from traveling outside of their borders, MAEs East and West serve as major gateways for international traffic.

In the U.S., where traffic is far heavier than in other countries, a large ISP typically peers with other large ISPs at multiple NAPs across the country. This provides a better way to manage traffic and offers insurance in case of an outage. It's also somewhat of a necessity because NAPs owned by competing companies don't share traffic, and MCI WorldCom doesn't allow ISPs to piggyback traffic from one NAP to another. For example, if an ISP wants to peer with other ISPs at MAE-East and MAE-West, the ISP has to establish a separate connection at each location.

Carroll, technician Steve Sherfey, who also served in the Army, and Dave Vacher, who spent 10 years as a state trooper before making the career switch to networking, are sitting pretty these days when it comes to bandwidth.

With its FDDI network maxing out, MCI WorldCom installed three Cisco StrataCom BPXATM switches each at MAE-East and MAE-West. The company is running concurrent networks, as it attempts to migrate existing customers over to ATM and to lure new customers to the service.

MAE-East consists of a series of three highly secure rooms. "It's a lot of boxes and a little bit of hum," says Ken Mitchell, who oversees the operation.

In the transmission room, behind a glass wall, tangles of cable aggregate traffic from customers, such as AT&T, Sprint, Cable and Wireless and Qwest, into a single OC-192 (10.56G bit/sec) SONET connection to the FDDI and ATM switches, Mitchell says.

In the colocation room, 80 cabinets painted industrial yellow house routers and other ISP gear. The third room houses the switches. The ATM boxes, which are trunked together by OC-12 connections, pack 48 DS-3 ports in a console the size of a dorm refrigerator. The ATM

switches are about half the size of the FDDI switches, which are dwarfed by the largest appliance in the room, a giant air conditioner.

Today, traffic at MAE-East peaked at 2.1G bit/sec around 5 p.m. That's a huge amount of traffic, considering that the Tokyo NAP peaks at 320M bit/sec and the London NAP typically tops out at 400M bit/sec.

## ATM rules in Chicago

The quiet, stark surroundings at Ameritech's downtown Chicago NAP belie the fact that this is one of the busiest spots on the Internet. The NAP's three Ascend ATM switches pump out 6 terabytes of data daily, which is double the traffic load from early 1998.

Despite the high volume of traffic moving through the NAP, most days the third-floor operation looks like a ghost town, with rows and rows of switches and SONET multiplexers humming away, most dedicated to Ameritech's voice network. Aside from a clunky metal desk and a couple of beat-up chairs, there's no sign of human inhabitants. The desktop is barren, the walls undecorated.

That's because similar to the setup in London, most of the circuits are provisioned remotely from an Ameritech data center in Southfield, Mich., and the switches are monitored at the company's network operations center (NOC) in Hoffman Estates, Ill.

Even though it's not his home base, Operations Manager Kevin Peterson can usually be found at the NAP testing circuits — but only during normal business hours. After hours, NOC engineers handle NAP operations. If an emergency crops up, they page Peterson or one of the other operations managers.

But Peterson can't recall such an event. The majority of the ISPs, international research organizations and government agencies using the NAP are great about upgrading their connections and engineering their lines to avoid congestion, says Andy Schmidt, product manager for Ameritech's NAP service, pulling out a printed report to support his statement.

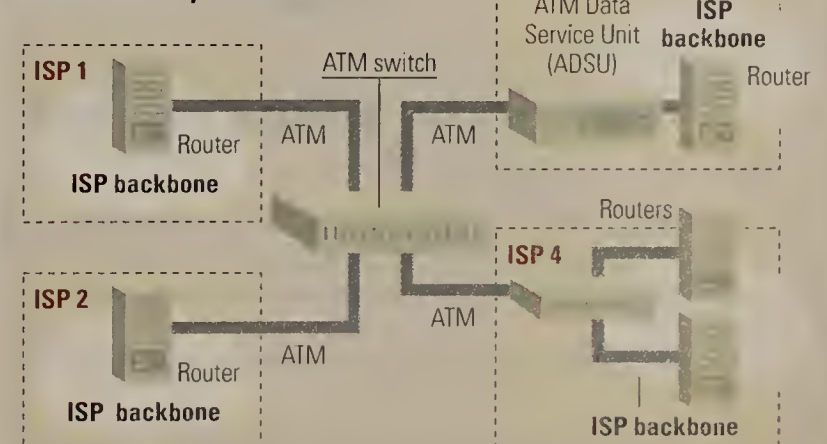
To further prove his point, Schmidt heads down a row of switches to the workstation running the Hewlett-Packard OpenView program used to count ATM cells passing through the exchange. A quick screen scan shows that of the 79 ATM switch ports, only two are losing any cells due to congestion.

More often than not, any congestion that occurs can be traced to an ISP sending too much traffic to another ISP's router rather than a lack of bandwidth at the ATM switch.

ATM's scalability makes it easy to handle the constant upgrades in the number of ports and port speeds

## In Chicago, it's ATM at the core

Large ISPs connect their backbones to Ameritech's Chicago NAP at speeds up to the OC-12 rate of 622M bit/sec. An Ascend ATM switch is used to establish a full mesh of PVCs between all ISPs, although an ISP can request that it not receive traffic from any other ISP.





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## Feature

required at the NAP — and that ability makes up for the heat Ameritech got four to five years ago for going the ATM route, Schmidt says.

Most of Ameritech's NAP customers have outgrown their original DS-3 connections and are now accessing the exchange at the OC-3 rate of 155M bit/sec. In November, the Chicago NAP became the first to offer access at the SONET rate of OC-12, or 622M bit/sec.

Schmidt says the next big step for the Chicago NAP will be providing direct Internet access to large corporations that decide to bypass ISPs. "We're starting to cross the threshold where a different business model makes sense."

### Last stop: San Jose

One of the first things you notice about MAE-West is the view.

MAE-West stretches out comfortably on the 10th floor of a building in downtown San Jose, with large windows opening out onto a cityscape framed by the Santa Cruz mountains in the distance.

chain-link cage. The rest of the room is dominated by rows of black metal cabinets that look like they could be Darth Vader's gym lockers. The cabinets contain routers and switches colocated by a variety of ISPs. More colocated devices are on the 11th floor.

Like MAE-East, MAE-West runs concurrent FDDI and ATM networks. At almost 2G bit/sec during peak hours of 10 a.m. to 1 p.m., the FDDI portion is running at near capacity. About 75 ISPs connect to the NAP via FDDI, and no more are being added.

New customers are encouraged to use the ATM portion of the NAP, installed less than a year ago. Each of the Cisco StrataCom BPX switches has 9.6G bit/sec of capacity, which has only started to be tapped by the 20 or so ISP connections. MCI WorldCom chose ATM for its upgrade path because it's more mature than Gigabit Ethernet or packet over SONET, says Dan Lasater, director of broadband applications.

Today, there doesn't seem to be a lot of excitement at MAE-West, which is how MCI WorldCom likes it. "You don't see anybody running around with their hair on fire," Lasater grins.

It's not always this calm. The most common problem is an individual ISP suffering an outage. In that case, MCI WorldCom will help trace the problem to the ISP's equipment or its connection.

The worst incident occurred when an entire FDDI switch failed, Lasater recalls. Though the company keeps spares on site, it took a few hours to get things back to normal.

If the building's power were to fail, a generator in the basement would kick in after about a minute. As an added backup, the battery in that corner office would provide power for about four hours. The battery is so large and heavy that it has to be bolted to the building frame.

Even with all the backup power, however, Lasater isn't satisfied. Today, a couple of electricians are here planning the installation of yet another battery. The existing battery is fine for now, Lasater explains. "But you noticed that not all the [colocation] cabinets are full."

It's midday in Northern California, and Lasater is watching MAE-West traffic slowly rise to a 1 p.m. peak of 1.9G bit/sec. Meanwhile, early evening Internet traffic is spiking in Europe, and Sano is sitting on the train from Yokohama to Tokyo as daylight dawns on another day in the life of the Internet.

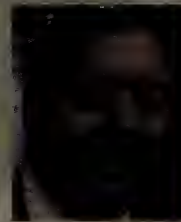
*This story was reported by IDG News Service staffers Clare Haney in Hong Kong, Rob Guth in Tokyo, Jeanette Borzo in Paris, Kristi Essick in Amsterdam, Jana Sanchez in London, as well as Network World staffers Beth Schultz in Chicago, Jeff Caruso in San Jose and Neal Weinberg in Vienna, Va. The story was compiled by Weinberg.*

## More Online

- Use our interactive map to get more detailed dispatches from the eight NAPs mentioned in this story.

- Check out the NAP Web sites for traffic statistics, network diagrams and lists of ISPs that connect to each.

- Ask Dan Lasater, MCI WorldCom's director of broadband applications and architect of the company's MAEs, a question about the Internet and its exchange points. He'll be online all week, responding to your questions.



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The large lead-acid battery used to provide backup power to the MAE takes up a corner office that many executives struggling up the corporate ladder would kill for.

It may seem strange to give a NAP such prime real estate — but this is Silicon Valley, ground zero of the Internet Revolution.

At its heart, MAE-West consists of three ATM switches, six FDDI switches, a handful of Ethernet switches and a bank of cross-connects, all enclosed in a





{ With an IBM Web Self-Service solution, they'd all be at the front of the line for ticket purchases, reservations, seat changes, flight availability or frequent flyer questions.

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## Cool Tools Quick takes on high-tech toys

Lee Schlesinger, Test Center director

### PHONE IN YOUR NET

**C**hances are you have, or want to have, a network at home, but you lack one of the amenities available at work — cabling. If you have your computers in a single room, cabling is not a problem

(except when it's time to vacuum) because you can string the computers together with 10Base-2 cabling or put a 10Base-T minihub on your desk. But if one computer is in your office and another is in the family room, you have to try something else.

A few months ago, I connected my home network with Intelogis' PassPort Plug-in Network (see [www.nwfusion.com](http://www.nwfusion.com), DocFinder: 1746), but I was disappointed with the product's performance. PassPort uses home power lines as its network fabric.

My next attempt was with ActionTec's ActionLink Home Networking Kit, which connects over internal telephone wiring.

The ActionLink installation kit comes with two plug-and-play PCI adapters. My clients recognized the adapters and installed the proper drivers perfectly. After setting a few TCP/IP parameters for internal network addresses, the two machines could see each other.

The next step was setting up one machine as a proxy server. ActionTec bundles software called DynaSyGate that allows you to do this in a fairly ingenious way.

You can set up two PCs with modems and use either to make the connection.

DynaSyGate had one huge drawback for me, however. It requires that you connect to the Internet via Windows Dial-up Networking. My Internet link is through a cable modem, which is always on in the manner of an Ethernet connection. DynaSyGate couldn't help me.

Luckily, there are other proxy server applications that do the trick.

I installed Osis Software's WinProxy on my gateway machine, configured a client to work through the gateway, and there I was, blithely browsing the Internet at 1M bit/sec. Well, actually slower — while 1M bit/sec is the rated speed of ActionLink, my internal network throughput was only 120K bit/sec, and the latency imposed by the proxy server slowed surfing still further. Still, that beats the 44K bit/sec modem connection, and there are no frequent busy signals. Talking on the phone while downloading from the World Wide Web had no apparent effect on throughput.

While ActionLink does the job and does it well, I can't help wishing for greater speed. What's the alternative? Next stop, wireless. Stay tuned. ▣

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### Coolness Meter

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**K**eeeping unauthorized users out of sensitive corporate data files is like keeping teenagers out of Bourbon Street bars. It takes a skillful bouncer to block unwanted visitors, yet ensure that regulars are welcomed graciously. We found that using hardware tokens with a good security server can make data access fast and easy for authorized users and also keep out the riffraff. While all the security servers we tested were comparable in the levels of security and performance offered, the servers varied widely in manageability, interoperability and price. We were especially puzzled by the dramatic price differences — a server's cost often wasn't indicative of its features and benefits. In fact, the overall best security server and hardware token system we tested, Vasco Data Security's VACMan/Server 3.0, was by far the least expensive.

Management worries

Token-based systems are inherently more secure than those based only on passwords, but also more difficult to manage. Of course, there's the problem of keeping track of 1,000+ tokens, but a more substantive concern is managing the back-end security server, also known as the authentication server. This is the platform that holds user configuration information for tokens and allows you to manage and edit the information. It gives the actual gatekeeper, the network access server (NAS), the information it needs to execute authorization, authentication and reporting. When it came to management capabilities, VACMan/Server from Vasco was the hands-down winner. Installing the system and adding users couldn't have been easier. VACMan/Server offers an array of access parameters: time, resource, password, number of concurrent logons and more. It lets you create user templates and import users from ASCII, Unix, Unix Remote Authentication Dial-In User Service (RADIUS) and Shiva LANRover files. VACMan/Server was also the most flexible security server we reviewed. It interoperates with a variety of

# Review

## ID, PLEASE

**Vasco's VACMan/Server proves its mettle in our look at four security server/hardware token combos.**

firewalls and virtual private networks (VPN), and through its Proxy Manager, VACMan/Server can support pretty much anyone else's programmable hardware tokens. Most important, its auditing and accounting capabilities are superb. VACMan/Server's Open Database Connectivity (ODBC) Accountant interface lets you log accounting information in real time into an ODBC-compliant database, which you can then use with any ODBC-compliant reporting tool. VACMan/Server's audit database is comprehensive, and it offers a module that can be used with Microsoft Access to create ad hoc reports. Vasco even includes a RADIUS test simulator that lets you conduct thorough RADIUS testing without configuring and deploying a special test NAS. Placing second in the manageability category was ActivPack from ActivCard. Adding and managing users with ActivPack is simple. And more so than the other security servers in this comparison, ActivPack concentrates on the management and administration of hardware tokens, making it easy to remotely activate, deactivate and reprogram tokens.

Product: **VACMan/Server 3.0**  
Vendor: **Vasco Data Security**

For sheer flexibility and scalability, as well as price, VACMan/Server 3.0 from Vasco Data Security takes home our Blue Ribbon.



ActivPack has test utilities that let you ensure that its database and RADIUS components are correctly configured to work with client applications before full implementation on the network. It also has an easy-to-use utility to let you customize user messages in Windows NT Remote Access Server (RAS). However, ActivPack is specifically designed for a Microsoft environment. Although its RADIUS module supports authentication for all RADIUS-compliant environments, it really isn't intended for use as an authentication server for anything but a Windows NT logon, Windows NT RAS or Microsoft Internet Information Server (IIS) application. Coming in a distant third for manageability was Secure Computing's SafeWord. SafeWord allows you to set user authorization privileges by time of week, time of day, day of week and date locking. As with VACMan/Server, you can specify the number of invalid logon attempts allowed before the system locks a user out. SafeWord also has access quotas, which allow you to specify that users with a given token are only allowed to access the network a limited number of times. However, while adding and managing users in SafeWord isn't difficult, it is clumsy. In fact, everything about SafeWord is cumbersome. Its reporting capability is severely limited, and the best thing you can say about its management interface is that it isn't text-based. Furthermore, while the amount of data that can be stored in the database and log files is fairly extensive, pulling reports from them is an- guishing. Managing the database is most easily done by exporting it to a standard format such as .dbf, making changes in your own database management system and then reimporting it into SafeWord.

Net Results	Pros	Cons
<b>VACMan/Server 3.0</b> Vasco Data Security (630) 932-8844, www.vasco.com \$5,495 for 500 users	▲ Excellent interoperability ▲ Comprehensive audit logs	▼ Poor documentation
<b>ActivPack 3.0</b> ActivCard (510) 574-0100, www.activcard.com \$15,000 for 500 users	▲ Excellent remote token management ▲ Easy installation	▼ Server has limited operating system support
<b>SafeWord 5.0</b> Secure Computing (800) 379-4944, www.securecomputing.com \$30,900 for 500 users	▲ Good interoperability ▲ Excellent audit logs	▼ Awkward management interface ▼ No integrated reporting
<b>Defender Security Server 3.0</b> Axent Technologies (301) 258-5043, www.axent.com RADIUS Server \$2,995; user licenses \$105 per user up to 10 users; \$12 per user for more than 5,000 users	▲ Excellent integrated reporting	▼ Poor interoperability

ScoreCard	Manageability 20%	Operating system integration 20%	Scalability 20%	Security 20%	Time to authenticate 10%	Documentation 5%	Installation 5%	Total score
VACMan/Server 3.0	8 x .20 = 1.60	8 x .20 = 1.60	8 x .20 = 1.60	8 x .20 = 1.60	7 x .10 = 0.70	5 x .05 = 0.25	7 x .05 = 0.35	7.70
ActivPack 3.0	8 x .20 = 1.60	8 x .20 = 1.60	6 x .20 = 1.20	8 x .20 = 1.60	7 x .10 = 0.70	7 x .05 = 0.35	8 x .05 = 0.40	7.45
SafeWord 5.0	6 x .20 = 1.20	7 x .20 = 1.40	7 x .20 = 1.40	8 x .20 = 1.60	7 x .10 = 0.70	4 x .05 = 0.20	5 x .05 = 0.25	6.75
Defender Security Server 3.0	6 x .20 = 1.20	5 x .20 = 1.00	5 x .20 = 1.00	8 x .20 = 1.60	7 x .10 = 0.70	6 x .05 = 0.30	7 x .05 = 0.35	6.15
Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score.								



As for managing the RADIUS interface — well, keep the documentation close by, and be sure to purchase a few hours of technical support (only the first 30 days are free) before you try it for the first time. Take careful notes during your attempt and store the notes in a safe place.

SafeWord's strong point is its elegant method of authentication forwarding. If a guest user tries to authenticate, SafeWord forwards the authentication request to the user's home domain. With this method, authentication domains don't have to be maintained separately at each remote site.

Within North America, SafeWord supports only hardware tokens from Secure Computing. ActivCard tokens are supported in SafeWord outside North America. Because of patent limitations, Secure Computing verifies a customer's location before activating support for ActivCard hardware tokens within the SafeWord software.

Defender Security Server (DSS) from Axent Technologies is best suited for those who want one-stop shopping for all of their security needs because interoperability is not its strong point. Case in point: During our test with our Aventail VPN, the connection kept locking up during the challenge/response sequence.

After a quick chat with technical support, we learned that DSS isn't guaranteed to work with any VPN but Axent's PowerVPN because of the design of the token's challenge/response security feature.

To work with DSS, a VPN client must be able to open a terminal window to initiate the challenge/response routine, which occurs at the character level.

## Where's Security Dynamics?

Security Dynamics is a market share leader for hardware-based tokens, but the company never responded to our many calls and e-mail invitations.

## NOS integration and scalability

As it did in the management category, VACMan/Server again distinguished itself in terms of interoperability. It supports Windows 95, NT 3.51 and 4.0, and Unix. It also has optional models to support NetWare binderies, Novell Directory Services, and firewalls from Security Dynamics and Axent. Through its Proxy Manager, VACMan/Server can interoperate with almost any firewall and VPN. Therefore, it can spread happily throughout your network without becoming

troublesome to integrate or manage.

ActivCard's ActivPack is made exclusively for Windows NT, which limits its scalability.

Secure Computing's SafeWord supports tokens from ActivCard, WatchWord and SecureNet, as well as its own. However, while it worked well with a BorderWare firewall, it wouldn't work with the Axent Raptor firewall. SafeWord supports authentication on all versions of Unix, VAX/VMS and NT 4.0 domains. It supports RADIUS for Windows NT RAS, allowing SafeWord through its RADIUS server to authenticate users trying to access Windows NT domains. Although SafeWord supports a broad range of platforms and authentication forwarding among the platforms, we think the task of managing them, given the cumbersome tools provided, would be monumental.

Axent's DSS for RADIUS runs only on an NT platform. Its one-platform support and practically nonexistent interoperability make it a unified security system only for companies that want to buy into a single-vendor framework. However, its awkward update procedures should make even one-stop shoppers hesitate. Because it doesn't support direct queries to NT domains, you have to import the NT domain user data into the DSS database — and you have to do so each time you make changes to the user authorization information.

## Performance and security

We attempted to break into the servers as a hacker would. All of the systems performed efficiently and well — and comparably — with authentication time being negligible. None of the security servers failed our security test. VACMan/Server outshone the crowd by supporting the broadest array of authentication protocols:

RADIUS, TACACS, XTACACS and TACACS+.

Also, its integrated RADIUS proxy module supports proxies to a host of other RADIUS-compliant servers.

One of the greatest features Vasco's VACMan is not the security server, but rather its amazing Digipass 300 hardware token (see photo).

Digipass 300 offers a full range of features, such as support for Triple-DES and optical data entry, which no other token offers.

ActivPack supports RADIUS, Microsoft's IIS and Windows NT RAS authentication. With this range of support, ActivPack offers tight security for Microsoft and RADIUS-compliant shops, but prevents it from being a choice for networks that must support other authentication protocols.

Secure Computing's SafeWord supports RADIUS, TACACS+ and its SecureID authentication protocols.

With its focus on end-to-end security, Axent's DSS offers tight security within a pure Axent security environment, but limited options otherwise. For example, DSS supports RADIUS only as an option — at a cost of an additional \$1,000. And as we mentioned, it supports only its own VPN, PowerVPN 3.2.

## Installation, documentation and online help

The quality of each product's documentation varied as much as their other features, but the best performer in other areas failed to follow through here. VACMan/Server's documentation is not only thin in content, it is poorly organized and difficult to follow. However, its technical support staff is accessible, responsive and knowledgeable.

ActivPack installed smoothly, and its documentation was well-organized and informative.

Secure Computing's SafeWord has an arcane installation routine and a convoluted scheme for adding licensing and serial numbers. The online help is skimpy. Customers receive 30 days of technical support free for evaluation purposes. After 30 days, customers have to purchase a support package if they need further help.

Installation of Axent's DSS is simple. That's good, because the product has minimal documentation. However, the vendor's technical support department is available via a toll-free number, and we found its personnel to be prompt, courteous and knowledgeable.

## Keeping out the riffraff

All of the systems we tested provided great security. Furthermore, each had unique strong points. For networks with widely distributed authorization, Secure Computing's SafeWord is a solid security server platform with an elegant distributed-authorization architecture. For sites with only Windows NT networks, ActivPack from ActivCard is definitely worth consideration. Network managers looking for a single-vendor, soup-to-nuts security system that includes firewalls, VPNs, authentication and authorization servers, should consider Axent's DSS.

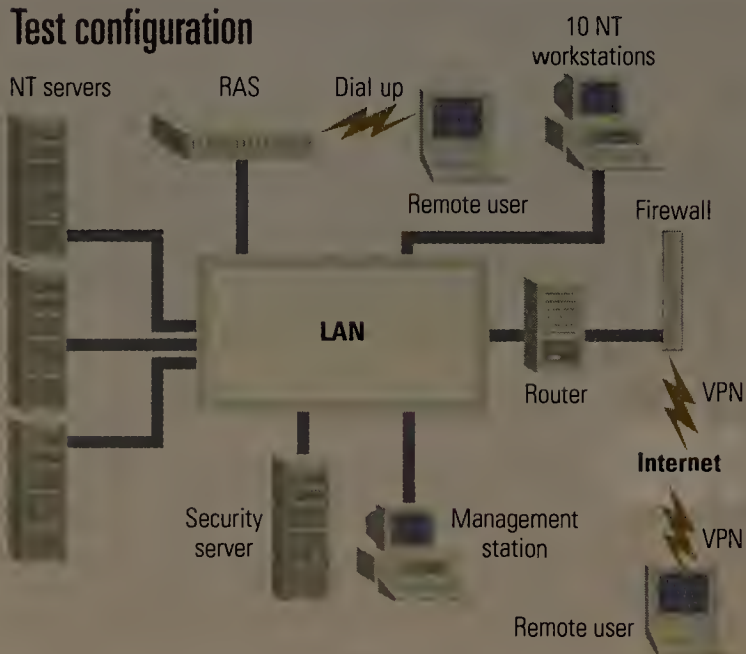
Security being equal among servers, however, we think that for ease of management, reporting capability and interoperability with other vendors' firewalls, VPNs and tokens, VACMan/Server was tops. Its great performance and reasonable price tag are also definitely advantages.

*Parnell is a telecommunications consultant and author with more than 18 years of experience in the telecommunications and data networking industry. She has written many articles, columns and product reviews, and is the author of four books on telecommunications, telephony and data networking. She can be reached at RedReviews@aol.com.*



Vasco's token

## Test configuration



This is disheartening and, in our opinion, a kludge and a potential safety violation. Isn't an open terminal window a great place to weasel into a network?

DSS doesn't support any hardware tokens other than its own, although software developers' kits are available for developing interfaces to support other cards.

But many network managers won't want to go to the trouble of custom development; for those seeking a soup-to-nuts security system, Axent may just be the ticket.

Axent's strongest feature is its reporting capability. DSS comes integrated with Crystal Reports and offers 21 report templates that will probably meet most of your needs.

**More Online**

- A checklist of questions to ask about tokens.
- Advice on creating a comprehensive network security plan.

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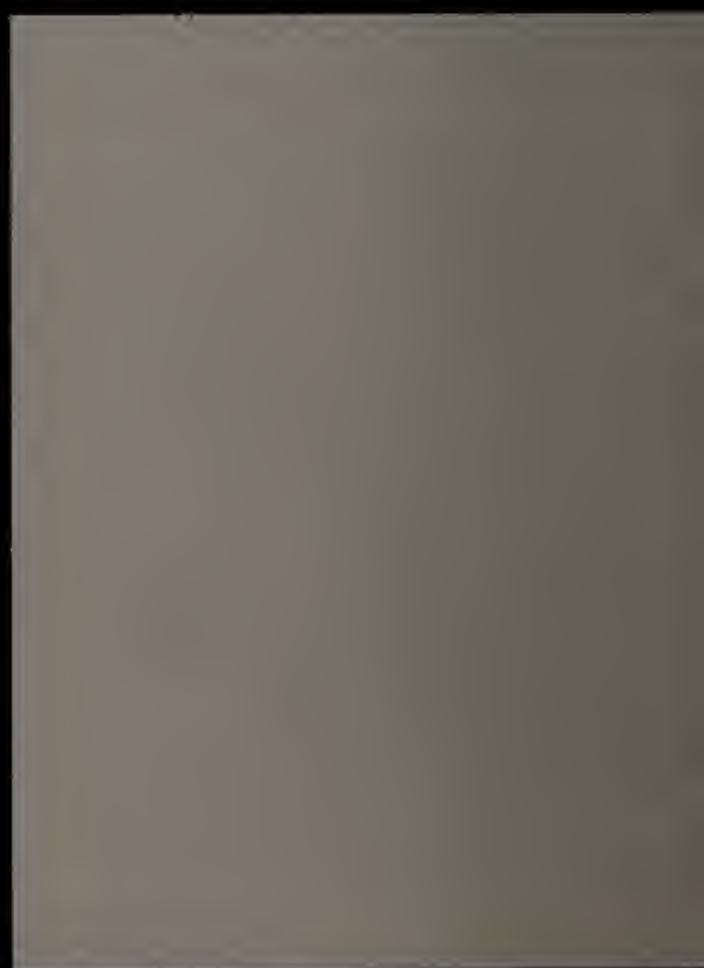
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# Management Strategies

Career Development, Project Management, Business Justification

## Metering messages

**E-mail chargeback policies force workers to pay the price for bogging down the network with nonbusiness traffic.**

BY PAUL MCNAMARA

Looking for a way to discourage frivolous e-mail use within your company? Try docking workers' pay for any messages they send over a preset maximum. That will make those joke lists and animated greeting cards seem a whole lot less amusing.

Chargeback policies have been attempted before, but experts say most organizations want no part of such Draconian measures. However, a growing number of companies are turning to chargeback policies as a tool for planning future infrastructure needs and to ensure that departments pay their fair share for the network resources they're using.

According to a survey of 50 organizations by Ferris Research of San Francisco, about 40% have implemented some kind of chargeback mechanism. Of that group, 22% assess charges based on overall network services, while just 18% are charging for e-mail usage only.

These numbers are certain to rise as e-mail networks continue to mushroom, the result of corporate mergers and acquisitions and e-mail itself becoming more ubiquitous, sophisticated and resource-intensive.

### WHO PICKS UP THE TAB?

**While e-mail chargeback policies are expected to become more popular, few companies have implemented them to date.**

Chargeback based on all network services: 22%

Chargeback based on just e-mail: 18%

No chargeback policy: 60%

SOURCE: FERRIS RESEARCH, SAN FRANCISCO

More  
**Online**

- Check out Ferris Research's report on e-mail chargeback systems.
- Get details about reporting products that can help you implement a chargeback system.



"Messaging is starting to cost more and more, and management is starting to rely on it more and more," says Bob Demond, president of RD Software Services, a reseller based in Bakersfield, Calif. "The natural thing is to start spreading those costs back to the people who are consuming the service."

As the messaging and Internet manager for the U.S. Department of Transportation, George Ramick oversees an e-mail hub with an X.500-based directory that connects seven different messaging systems used by 75,000 federal employees in 14 agencies. Ramick's operation is funded entirely by a chargeback system that imposes a flat fee on each agency, adjusted a bit based on the number of users.

"At one point we were going to charge based on kilobit usage, but our chief information officer intervened and said no," Ramick says. "We didn't want to provide an incentive for Department of Transportation agencies to step away from using our systems because they thought they could find a cheaper way."

However, Ramick wants to show agencies that they're getting their money's worth from his services. Toward that end, he's implementing reporting software from Tally Systems. Dubbed Veranda, the package also allows companies to implement chargeback policies based on usage parameters, such as the total number or volume of messages. Veranda costs \$35,000 for a 10,000-user license.

"We're like any other business, so what I need to do is offer services at a reasonable rate and demonstrate that the services I've provided are real," Ramick says.

Naturally, Department of Transportation agencies such as the Federal Aviation Administration and the U.S. Coast Guard aren't always cognizant of the value they're receiving from the e-mail hub. "People say they don't use the system that much, but they don't know how much they use it," Ramick says.

Along with Tally, several other vendors provide software for measuring e-mail usage or applying chargeback fees, including ViewPoint from Automated Business Solutions, AppManager Suite from NetIQ and 2MA from MessageWise.



**George Ramick, messaging and Internet manager for the U.S. Department of Transportation, passes the cost of the federal bureau's mail hub along to the agencies that use it.**

Moreover, there are many different ways to assess chargeback costs, including systems based on a fixed rate per user, number of messages sent or received, storage space used, or some combination.

"Many folks are just charging for Internet e-mail traffic because that's where the cost of the bandwidth is the largest, and where they really have to watch traffic to make sure they have a large enough pipe," says Karen Kaliski, Tally's vice president of product marketing in Lebanon, N.H.

Rolling out a chargeback program can be tricky, and experts say top-level executive support is critical.

"A lot of people are just opposed to the idea of being charged for something that they believe is fundamental infrastructure," says Jonathan Penn of Ferris Research.

The ongoing proliferation of junk e-mail — jokes, greeting cards and excessive personal correspondence — has been one of the primary forces driving interest in chargeback schemes. "Every manager I know is concerned about how much garbage is coming in that is not work-related," says RD Software Services' Demond.

Do not, however, expect e-mail chargeback to be a cure-all for this problem. "It's a little early to tell whether [chargeback] really influences user behavior," Penn says.

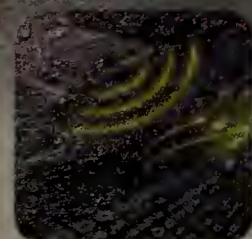
*McNamara is a senior editor at Network World. He can be reached at paul\_mcnamara@nw.com.*



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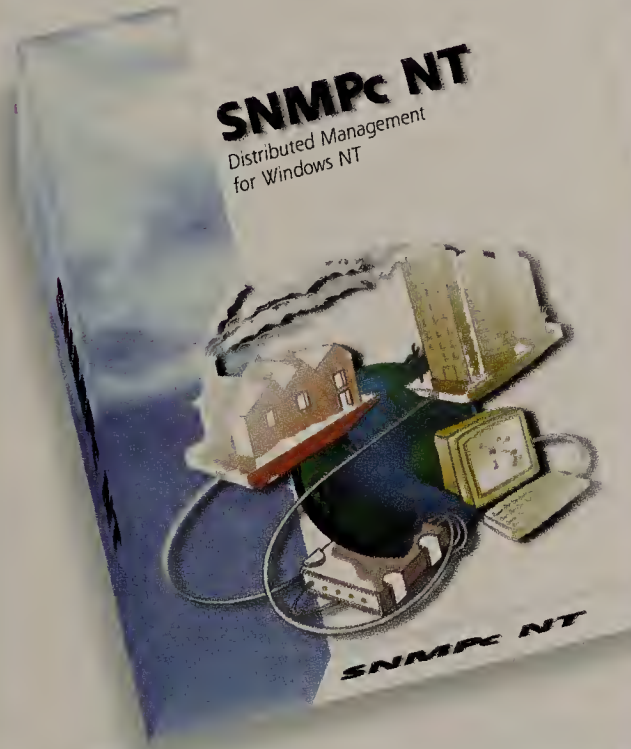
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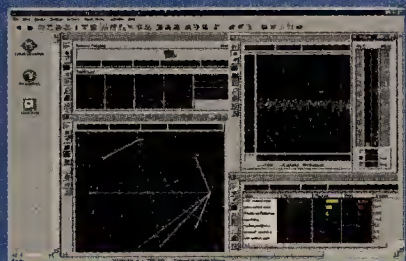


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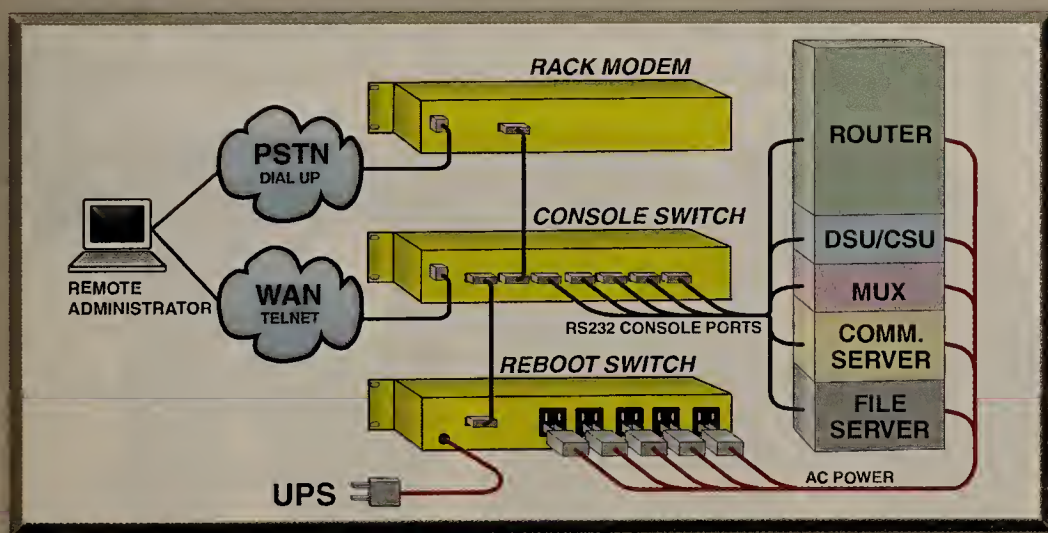
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




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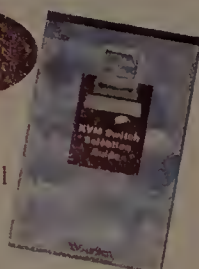
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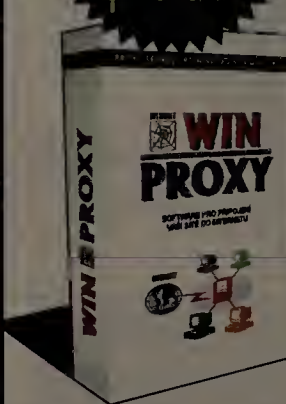
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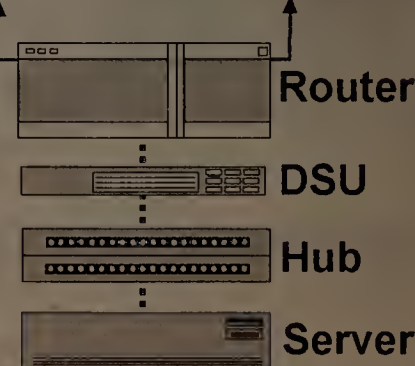
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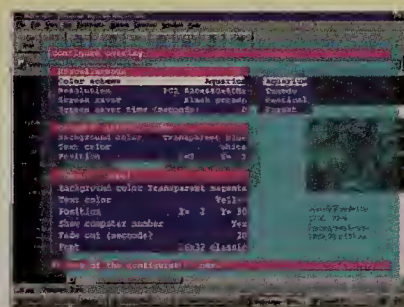
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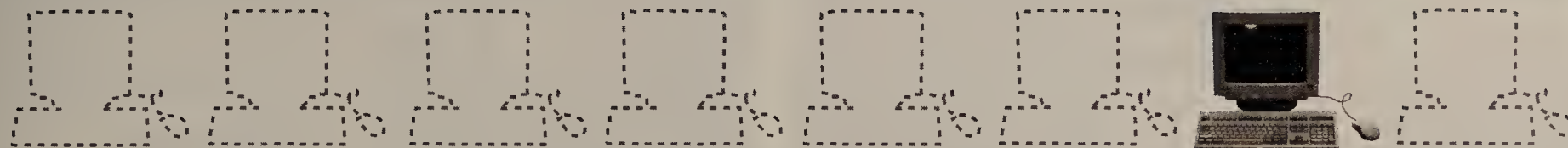
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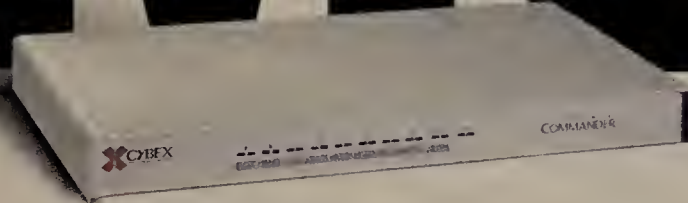


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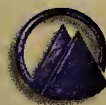
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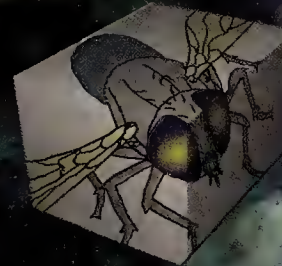
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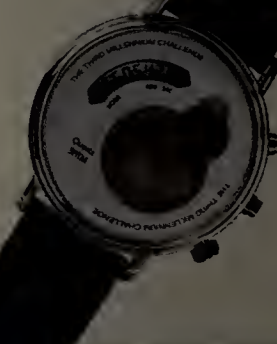
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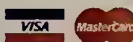


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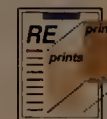


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**DSL,**  
continued from page 1

a shared medium.

That is true, at least until the DSL line hits the first device in the service provider network, known as a DSL Access Multiplexer. There, DSL access lines are typically aggregated onto an oversubscribed backhaul trunk into the carrier's switched/routed network. That trunk represents a potential bottleneck that could make the service crawl.

"All networks are oversubscribed," explains Bill Southworth, chairman and CEO of Harvard.Net, an ISP in Boston that specializes in DSL access. "And it works as long as there is enough capacity so aggregated traffic doesn't get throttled."

When bandwidth through the service provider network is truly guaranteed, customers have to pay. For example, UUNET's UULink DSL Internet access costs \$500, \$600 and \$900 per month for 128K, 364K and 768K bit/sec of guaranteed bandwidth, respectively.

Low-cost DSL services, such as the rock-bottom \$39 per month SBC Communications charges for a service supporting 1.5M bit/sec downloads, don't come with such guarantees.

are not even close to dropping a packet," says John Stormer, NorthPoint's vice president of marketing.

GTE, which has done some of the most thorough real-world DSL testing, says that 10-to-1 oversubscription still provides full throughput to cus-

**■ The backhaul could be oversubscribed by 100 to 1 because not all the customers would be on at once.**

Dale Veeneman, senior principal member of technical staff, GTE Labs

tomers 95% of the time, even if they are all surfing the Internet simultaneously. That's because even during heavy Web surfing, the link is idle much of the time, according to Dale Veeneman, senior principal member

access but has another carrier set up the DSL links. Customer traffic is concentrated onto an oversubscribed link into the DSL provider's network, and then aggregated again onto an oversubscribed link to the ISP.

Customers need to be aware of aggregation practices into and out of the DSL carrier network, Veeneman says.

Harvard.Net's Southworth says he is always buying more bandwidth for Internet links to limit oversubscription and prevent service degradation.

Because there are multiple possible choke points, customers need to be clear about what part of the network the guarantees cover when they negotiate SLAs, says Beth Gage, an analyst with TeleChoice, a telecommunications consulting firm in Boston.

"Some SLAs don't start until the switching office, and some only cover the last-mile link," she says. "You need to go step by step through what is covered, from physical and logical links to outside events like acts of God."

Gage also notes that because DSL networks are still being built, links that are engineered to be oversubscribed may not be oversubscribed yet. What may work fine today might degrade tomorrow if service providers don't adjust as they add more.

Customers can check end-to-end DSL performance by pinging the mail server at the ISP. The ping will measure round-trip time and see if packets are dropped, says Mike Lutz, a former network manager who researches DSL for Avalon Networks, an ISP in Iowa City, Iowa.

If the customer can find an FTP server directly linked to the same ISP, downloading a file can indicate just how much bandwidth the DSL service provider is delivering, Lutz says.

Network World Senior Editor Denise Pappalardo contributed to this story.

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The  
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## WHAT'S WINNING: CABLE OR DSL?

**L**imitations aside, many telephone companies have great expectations for digital subscriber line (DSL) technology. But in competition with cable modems, to which it is most often compared, DSL is lagging behind.

At the moment, cable modem access to the Internet is outstripping DSL by a ratio of about 10 to 1, but the game is still young.

So little of either service has been sold that they barely register as blips on the Internet-access radar screen. Generous estimates put the U.S. cable modem and DSL customer total at about 650,000 combined.

Gecko Research tallied 600,000 cable modems in use in the U.S. vs. 15 million households that could have bought the service — a penetration of 4%.

DSL runs over regular phone lines, and with 177 million phone lines in the U.S., DSL penetration is so far below 1% that a statistician would say that for all intents and purposes DSL services do not even exist.

Nevertheless, both technologies hold promise as high-speed on-ramps to corporate networks and the Internet. Each technology has its strengths and weaknesses.

The main problem with both services is that they are not universally available. A corporate customer trying to piece together a broadband remote access strategy might have trouble getting either service for all sites.

Cable is plagued by the problem that bandwidth is shared by all cable modem customers on a given network segment. That means bandwidth available to any one customer can vary widely depending on how many other customers on that segment are using the service and for what purposes.

As the DSL story (this page) points out, DSL has potential bandwidth problems of its own — you may not be getting the bandwidth you think you are due. Furthermore, the lack of quality lines means DSL may not be available to 30% of customers in certain areas.

To overcome line problems, some carriers may offer lower-speed DSL service, sometimes as low as 128K bit/sec. The upside: Even at that speed, DSL will be perceptibly faster than dial-up modems.

Much of the future success of DSL and cable modems depends on the variety of services they will come to support.

For example, cable and DSL vendors are working on augmenting data services with voice. Some forms of DSL already support one voice channel, but vendors are coming out with gear that can stuff up to 15 digital voice channels into a single DSL stream.

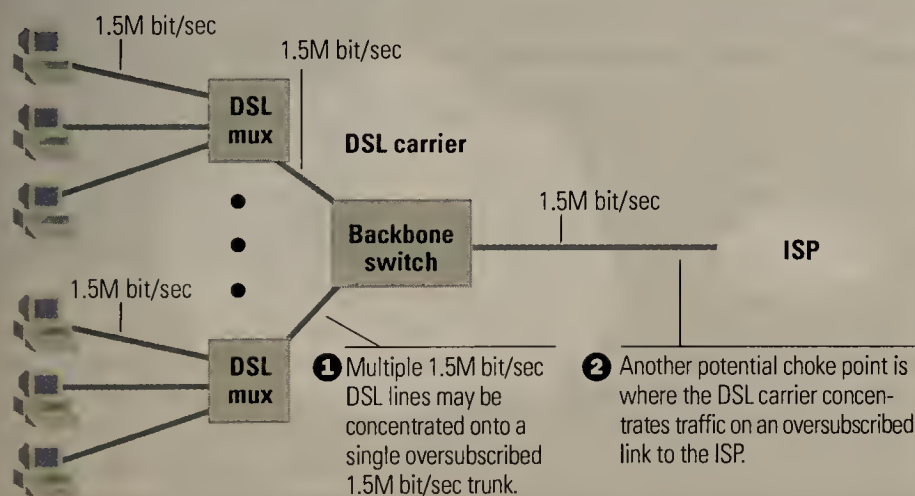
Cable providers are also investing heavily in upgrading their networks to support telephony, but they are at a disadvantage because they lack experience with telephone switching and billing.

Beyond technical aspects, cable and DSL are coming closer in price. Service providers in both camps now offer Internet access for as low as \$40 to \$60 per month for basic service.

— Tim Greene

## Track your DSL bandwidth

Services based on digital subscriber line may start out fast, but overall throughput depends on what happens at key aggregation points.



## What's a good number?

DSL provider NorthPoint Communications oversubscribes its trunks by a measure of 2 to 1, meaning the bandwidth coming into a network trunk is twice what the trunk can bear. That method works without degrading customer service because in practice, all customers aren't using their lines at the same time. "That ratio is very conservative. We

of technical staff at GTE Labs.

With a group of casual Internet users as customers, the backhaul could be oversubscribed by 100 to 1 because not all the customers will be on at once, Veeneman says.

## The ISP link

But there are other potential oversubscription bottlenecks, Veeneman warns.

Often an ISP offers DSL



**Accelar,**  
continued from page 1

Gigabit Ethernet links.

Nortel would not reveal details about the Accelar 8000 last week, so backplane speeds, port densities, pricing and availability could not be learned by press time. But sources say Nortel plans to scale the switch to support more than 100 Gigabit Ethernet ports, between 240 and 384 10/100 ports and 200 million packet/sec.

By contrast, Cisco's Catalyst 8540 is a 13-slot, 40G bit/sec switch that forwards 24 mil-

lion packet/sec. It supports up to 128 routed 10/100 ports or 16 routed Gigabit Ethernet ports, according to Cisco.

The Catalyst 8540 began shipping late last year.

## Pricing strategy

Sources also say Nortel will offer the Accelar 8000 at a very aggressive price in order to win back business from users who have opted for products from Cisco, Extreme Networks, Foundry Networks and Packet Engines. Currently, industry average pricing for Layer 3 10/100 and Gigabit Ethernet

backbone switch ports is about \$600 and \$2,000, respectively.

Nortel has to be aggressive in pricing to steal customers away from Cisco, says Todd Hanson, an analyst at Dataquest in San Jose.

As for the configuration of the switch, two of the Accelar 8000's slots will house redundant switching fabrics, sources say.

The remainder will house Layer 2 10/100 and Gigabit Ethernet modules, and ATM blades, they say.

Layer 3 capabilities will be isolated on the switch fabric modules to achieve telco-like redundancy and centralized control, sources say. The switch controllers may also sport up to two Layer 2 or Layer 3 Gigabit Ethernet or ATM uplinks, they say.

The eight user slots will house modules that perform Layer 2 switching at wire speed, sources say. The

## By the numbers

### Worldwide Layer 3 switched Ethernet market share for 1998

Company	Revenue	Ports
Bay/Nortel	36.8%	29.1%
3Com	19.4%	12.3%
Cabletron	7.9%	12.4%
Extreme	7.6%	19.9%
Cisco	7.2%	3.2%
Lucent	2.1%	1.1%
Xylan	1.9%	3.7%
FORE	1.7%	1.5%
Sumitomo	1.3%	1.1%
Intel	1.3%	2.9%
Other	12.8%	12.8%

Total revenue: \$637.4 million  
Total ports: 1,166,200

SOURCE: DELL'ORO, PORTOLA VALLEY, CALIF.

Accelar 8000 will also recognize Layer 4 information so traffic can be prioritized and forwarded based on particular applications.

The Accelar 8000's ATM component will come from Nortel's existing ATM technology, but not from its 4-year-old Centillion switch, analysts say.

"If you look at the Centillion architecture, it was great for what it was. But the only place where it still is doing really well is in a lot of token-ring installations," says an industry analyst who requested anonymity. "Then again, if you're only interested in token-ring switching, you're paying a lot for the ATM architecture."

## Broader plan

Eventually, Nortel will add ATM technology from its Passport switches to the Accelar line, analysts say.

The Accelar 8000 will be part of a broader enterprise network rollout from Nortel that is also expected to include WAN modules for the Accelar 1200; a high-density 10/100 and Gigabit Ethernet aggregation and distribution switch to go up against Cisco's Catalyst 6000; and ATM uplinks for the Bay-Stack 450. ■

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■ **"We're starting to transition our wiring closets to gigabit, and we really need something with higher density in the core."**

Miguel Corteguera, assistant director for college network services, Miami-Dade Community College

**Nortel,**  
continued from page 1

result in a blade, or specialized software, for Nortel division Bay Networks' Accelar switches.

Nortel's aim is to give the Accelar line the ability to efficiently direct Web traffic. At first, Nortel will sell IPivot appliances alongside the Accelar line, sources confirm. The next step will be to transform core IPivot hardware into a blade that plugs into the Accelar switches.

Eventually, Nortel may take the software code from the IPivot Intelligent Broker device and plug it right into the Accelar switches, the sources say. That way, every switch will have the ability to balance Web traffic.

Nortel and IPivot refuse to comment on the deal, which is expected to be revealed at the CeBit trade show in Hannover, Germany later this month. Nortel is expected to ship the devices by the end of March.

Nortel is not far behind the other three top hardware players. 3Com has yet to flesh out its load-balancing strategy, which largely consists of recommending that cus-

tomers tap the load-balancing features built into Windows NT. Cisco has long sold its Local Director, but as is the case with some other Cisco products, customers have complained about high prices. Cabletron, meanwhile, last month struck a deal to sell load-balancing products from F5 Labs along with its SmartSwitch Router line. Like



**Nortel will be rebranding IPivot's Intelligent Broker load balancer for its Accelar line.**

the Accelar, the SmartSwitch is a high-end Layer 3/Layer 4 chassis-based switch that supports Gigabit Ethernet.

Much like Nortel's reported strategy, Cabletron's plan is to take code from F5 and put it into the SmartSwitch, company officials say.

Load-balancing devices distribute incoming Web traffic among servers. Companies can perform load balancing

through a black box, such as IPivot's Intelligent Broker, or through a Layer 4 switch, such as Alteon's Acedirector or Foundry Networks' Server-Iron. Intelligent Broker only parses incoming traffic; it doesn't forward it. The IPivot products must be attached to a forwarding device, such as a switch or a router.

IPivot boxes will connect to the Accelar switch via a 100Base-T link. User requests — in the form of TCP/IP packets — will enter the Accelar switch, which will pass them off to the IPivot box. The box will decide which server to send the requests to based on a number of parameters, including traffic and/or application type. Intelligent Broker will then pass the requests back to the Accelar along with the appropriate server IP address in the packet headers.

By year-end, the IPivot boxes should be able to support Gigabit Ethernet connections.

Bay is expected to use the latest IPivot devices, which will be announced in a cou-

ple of weeks. The new appliances from IPivot have a completely revamped hardware architecture. IPivot's upcoming Intelligent Broker 7000 uses Layer 7 information to perform content-aware load balancing. That ability means it can peer further into a packet to distribute traffic by URL or transaction type. Layer 4 load balancers can only see deep enough to identify the type of traffic, such as whether it's File Transfer Protocol or HTTP.

Nortel plans to resell Intelligent Broker 4000, 7000 and 7000m. The 7000 series uses Layer 7 information to load balance by URLs among geographically distributed servers.

The use of Layer 7 for load balancing is somewhat controversial. While there's no question that Layer 7 support gives a device more information than is garnered at Layer 4, there's some debate as to whether that information is worth the performance hit.

The real value in load balancing at Layer 7 is the ability to prioritize user requests by application. For example, you could route revenue-producing requests from e-commerce

sites to faster servers and send people who are just browsing to a slower server. But looking deeper into the packet also means slightly slower performance and higher cost. "At the moment, there aren't a large number of really compelling applications," says Peter Christy, principal analyst at Collaborative Research.

## Up and coming

IPivot is a promising start-up based in San Diego. Brett Helm, IPivot's president and CEO, was vice president and general manager for @Work, a division of the @Home cable service company.

So far, IPivot has secured nearly \$15 million in two rounds of financing. Backers include Doll Capital Management and Crosspoint Venture Partners.

Traffic management, which includes load balancing, is a hot market that could grow from \$132 million in 1998 to \$1 billion by 2002, according to Collaborative Research. Analysts say they wouldn't be surprised to see load-balancing companies get snapped up by more established network equipment players this year. ■



# Branch offices get headquarters-style voice features

*MCK Communications device puts full-featured PBX support in remote offices.*

BY DAVID ROHDE

LOS ANGELES — Bringing headquarters-style voice features to the remote branch office is the motive behind a new product from MCK Communications.

At this week's Computer Telephony Expo, MCK of

Newton, Mass., will unveil the Branch Office EXTender 6000, a device that transports PBX features to small remote offices over frame relay, ISDN, digital subscriber line, fractional T-1 and other WAN links.

Deployed in pairs — one at the PBX site and one at a small branch office — the EXTender

6000 provides the full feature set of the PBX and its peripherals, such as voice mail systems, to branch-office end users. As a result, end users can dial co-workers using only four or five digits, or can transfer voice mail messages as if they were in the office themselves.

In addition, end users desig-

nated as primary or back-up call center agents can receive computer-telephony features common to 800-number centers, such as customer service data about callers.

The device fills a hole in PBX internetworking, according to analysts. The major PBX vendors have branch-office models of their flagship PBXs but not at price for small offices. They also offer feature-extension devices — some manufactured by MCK — targeted at individual telecommuters rather than a branch-office workgroup.

By contrast, key systems — basic telephony switch systems for small offices that the EXTender 6000 can replace — don't offer the same feature set as PBXs.

"The internetworking companies have delivered remote data access to branch offices, but voice applications have fallen short," says Nick Lippis, president of the consulting firm Strategic Networks.

The EXTender 6000 provides network administrators with a choice of voice-compression algorithms, enabling support for up to eight branch employees over a single ISDN Basic Rate Interface or two DS0 64K bit/sec lines. As a result, the device will reduce the WAN bandwidth required, Lippis says.

The EXTender 6000 is currently available to work with Lucent and Nortel Networks

PBXs, with support for other manufacturers' models planned. The list price is \$3,895, or \$7,790 per pair. Trade discounts from MCK distributors, including some big local exchange carriers and Williams Communications, are expected to offer prices below \$7,000 per pair, according to MCK President Woody Benson.

## Big guys opening up

In a development related to the improvement of nonproprietary converged networks, at least four companies — Lucent, Motorola, Ericsson and Natural Microsystems (NMS) — late last week were expected to make portions of their source code for carrier-class products available as open source.

The move, spearheaded by NMS — a Digital Signaling Processor board manufacturer and computer-telephony software developer — is part of the push for more open platforms in the traditionally proprietary telecom world.

NMS will provide code from its Alliance Generation product suite, which includes hot-swap CompactPCI capability for Windows NT and Unix platforms. CompactPCI is a ruggedized hardware platform designed for carrier environments.

The CompactPCI hot swap specification defines how to install and remove boards without bringing down a system. ■

# Intel's Merced will coexist with 32-bit chips

BY DENI CONNOR

PALM SPRINGS, CALIF. — Intel's 64-bit Merced chip is supposed to ship by the middle of next year, but it will be a good deal longer than that before today's 32-bit world disappears.

Attendees of Intel's Developer Forum (IDF) last week were excited about the move from 32 to 64 bits. But the enthusiasm was somewhat

benefit and value and meet customer needs, 32-bit processors will be available. We will introduce Cascades [a 32-bit upgrade] at the end of this year and Foster [another 32-bit upgrade] next year, and then we show [on our roadmap] some unnamed bubbles beyond that into 2000," he says.

## Equity protection

Today's programs will run fine on Merced. However, to

others interviewed, developers at Bindview have found the move to 64 bits to be relatively painless. "In the development of our Windows NT products, we've seen that it is basically a simple recompile to move Bindview EMS from one platform to another," Hutchinson says.

## What flavor to serve?

Some PC server vendors are also eyeing a dual strategy. Peter

Glaskowsky, senior analyst for the Microprocessor Report in Sunnyvale, Calif., says that low-end servers will remain 32-bit, while high-end servers, such as Hewlett-Packard's LXr-8000, will move to 64-bit. "If you look at entry-level servers, the pricing for Merced

does not enter

acceptable ranges until 2003 or 2004, and it could be a year or two longer than that," Glaskowsky says.

Compaq and Intel are in general agreement on the direction of microprocessors. "Compaq will develop on both IA-32 and IA-64 platforms," says Paul Santeler, enterprise x86 segment director at Compaq. "When Merced is available, we will ship our high-end Proliant servers on Merced, reserving 32-bit processors for our low- and middle-end servers. As price performance levels out in the years after 2000, we will start to migrate our mid-range Proliants to IA-64." ■

**"We will continue to invest in whatever the laws of semiconductor physics will allow on a 32-bit architecture . . ."**

John Miner, vice president and general manager for the Enterprise Server Group, Intel



dampened by the reality that most software development — and most low-end servers — will revolve around the tried-and-true 32-bit architecture for years to come.

Intel has pledged to boost 32-bit performance to the limit, even after its high-end line leaps to 64-bits. "We will continue to invest in whatever the laws of semiconductor physics will allow on a 32-bit architecture for servers and workstations," says John Miner, corporate vice president and general manager for the Enterprise Server Group at Intel.

"As long as we can deliver

take advantage of the full speed boost, software will need to be rewritten. Many programs, including word processing and low-end server applications, don't really need a 64-bit boost. Others, such as databases and technical workstation programs, will benefit greatly.

One management software vendor has a dual strategy. "Bindview will, of course, continue to support IA-32, as well as IA-64 platforms," says Scott Hutchinson, lead developer for Bindview Development, one of the few software vendors viewing the wares at IDF.

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# Backspin

## Ranting, raving and chasing bills

It all started when I received one of my telephone bills. Last December I had my fax line converted to digital subscriber line (DSL), and there were several things about the bill that needed further explanation.

First there was the question of why the service cost \$15 more than Pacific Bell had said it would. And why did I apparently have both MCI and AT&T as long-distance carriers? And finally, why was some outfit named OAN billing me \$3.25 on behalf of some other company named IntelNet for a service charge and a "PRESUB CHRG" (whatever that was)?

Lucy, the Pacific Bell customer service representative who fielded my cranky call, was extremely helpful and charming and partially sorted things out. I have no complaints about her — indeed, I commended her to her supervisor. But neither Lucy nor her supervisor could explain all of the items on the bill.

The overcharging, for example, remains a mystery. But it

became a non-issue when Lucy told me PacBell had reduced the service price by more than half. Of course, it wasn't as simple as that.

It turns out you don't get the new price unless you ask for it! PacBell apparently sent me a notice about this but I never saw it — my wife usually handles the bills, and how should she know what DSL is? I asked why PacBell didn't just apply the new pricing to existing DSL accounts, and I was told it was too expensive to do so. Huh?

<rant>How the heck could sending out pieces of paper to thousands of customers and then fielding their calls be less expensive than just giving everyone the new DSL pricing? And did PacBell think anyone would call up and complain that they wanted to pay the old price? </rant>

We did establish that the AT&T charge was due to the fact that

the company was automatically selected by PacBell to be my long-distance carrier.

Even though I didn't make any AT&T long-distance calls, AT&T charges a minimum of \$3 (plus tax) per month to be your long-distance carrier.

I didn't make any AT&T long-distance calls because I opted to dial 10-10-222, which is a discount MCI service. That accounted for both MCI and AT&T both showing up on my bill. I cancelled my AT&T "dial one" service on the spot.

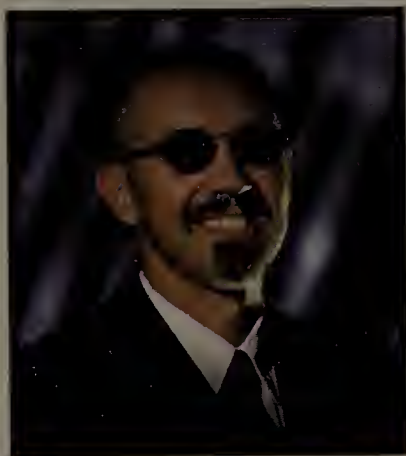
<rant>With all of the U.S. Department of Justice's purported interest in consumer rights and monopolistic practices, how is it that AT&T can charge you for not using its service? I find it hard to believe there is a significant cost to supplying no service, yet AT&T is allowed to levy a charge on the off-chance you might use its switches. Come on Ms. Reno & Co., and for that matter, all of you people at the FCC clown show. Do something for consumers that really means something and curb the rapacious telcos.</rant>

The OAN charge was the stump-the-band item. OAN is a billing aggregator and it passes billing items to PacBell, as it did in this case for IntelNet. PacBell had no idea what exactly the charges were for. That is the most ridiculous thing I have heard in a while (although the question of what "is" is, beats it hollow).

<rant>It seems to be a quintessentially anticustomer service to just accept third-party charges without checking their validity, putting the burden completely on the consumer to track down the charges.</rant>

There's more on this matter, so next week my conversations with OAN, IntelNet and other billing issues. (Oh, we finally closed the voting on the corporate vigilantism issue, and roughly 20% of you think it's OK to do something physical to hackers or their equipment. We need to talk about this.)

Discuss what your bill is (or what Bill's "is" is) at [nwcolumn@gibbs.com](mailto:nwcolumn@gibbs.com) or (800) 622-1108, Ext. 7504.



MARK  
GIBBS

# 'NET BUZZ

**Typos happen . . . ask any journalist.**

Or ask my childhood neighbor, Mr. Vigorito, whose clothing store once placed a newspaper ad for "knit shirts," only to have a typesetter drop that mission-critical "r" from "shirts." My 11-year-old friends couldn't stop giggling, although businessman Vigorito was not at all amused.

You can also presume they aren't laughing these days at E-Trade, Infoseek, Lycos, Amazon.com or virtually any other online concern that has made a big name on the Internet. Typos are taking a toll on the branding of these famous companies for two reasons: Some Web surfers couldn't spell URL if you spotted 'em the "u" and the "r," and the 'Net has no shortage of weasels willing to exploit that fact.

Which brings us to the so-called "typo Web site," a URL intentionally designed to divert the alphabetically challenged from their intended destination to someplace else. That someplace else is usually a porn site or fly-by-night way station with links to porn sites.

These sites are not a new phenomenon, and the Internet community's grown-ups are searching for a fix as they overhaul the Domain Naming System. However, a recent survey by Solid Oak Software — maker of Cybersitter — shows that the sheer number of these typo "para-sites" may be greater than most realize. Solid Oak identified literally thousands of intentionally misspelled URLs. Finding others isn't hard, though you may want to wait until you get home to try.

A few examples: Cisko.com? Porn site. Ecxite.com? Porn site. 2com.com? Porn. Anazon.com? Porn. Hotmale.com? C'mon, what do you think? Infoseek alone has at least five "typo sites."

Can Web surfers possibly misspell famous URLs often enough to make this scam a traffic generator? Well, maybe. A Scottish computer consultant tells me his Macdonalds.com site has had 36,000 hits in three months. A guy who registered a misspelling of monster.com in anticipation of the job-search company's splashy Super Bowl ads reported 400 hits . . . just during the game.

Isn't this trademark infringement? Oftentimes yes, says David Maher, a Chicago-based attorney. Among the few dozen test cases that exist, McDonald's, Mattel, Bally's and even Playboy (irony of ironies) have successfully defended their URLs, Maher says.

But not even this country has enough corporate lawyers to squash the para-sites one by one.

You might think domain name registrar Network Solutions, Inc. would stop them by simply rejecting the most bogus names. NSI, however, claims it has no choice but to keep on cashing the checks from these typo artists.

The good news is that help is supposedly on the way from the would-be fixers of the domain name mess: the Internet Corporation for Assigned Names and Numbers, and the World Intellectual Property Organization. The latter may issue recommendations addressing these trademark issues as soon as this week.

Here's hoping they contain a dose of "just say no" common sense. Meanwhile, make sure your kids know how to spell "Beanie Babies."

**Who's this new Buzz?** Writing a column about the Internet has been a dream of mine since way back when. . . . OK, more precisely, since I first learned that my longtime friend Chris Nerney was writing one called "'Net Buzz." "How hard can it be?" I recall thinking.

We're about to find out, as Nerney's departure for internet.com has left "Buzz" in my hands. Needling aside, his will be roomy sneakers to fill.

The good news for readers — at least I hope it's good news — is that I've done this kind of gig before, as an editorial writer and columnist for a daily newspaper. The subject matter there was primarily human interest and politics. . . . Any shortage of those on the 'Net?

Please let me know how I'm doing.

Contact Paul McNamara at [pmcnamara@nww.com](mailto:pmcnamara@nww.com) or (508) 820-7471.



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